MLDS Center
Maryland Longitudinal Data System
Better Data • Informed Choices • Improved Results

February 2021

Educational and Workforce Outcomes for Associate's Degree Graduates from Maryland's Community Colleges, Supplement to Full Report: Outcomes by Degree Type

INTRODUCTION

Overview

There are sixteen community colleges in Maryland which collectively enrolled over 138,000 students in the Fall 2013 term.[1] Maryland's community colleges are predominantly open enrollment, providing access to a college education to high school graduates and adult learners at all levels of academic preparation. Community colleges in Maryland offer two types of Associate's degrees: Career degrees and Transfer degrees. Career-focused Associate's degrees are intended to prepare graduates to enter the workforce directly after graduation, while Transfer-focused Associate's degrees are intended to prepare graduates to pursue Bachelor's degrees at four-year institutions. This report supplements the *Educational and Workforce Outcomes for Associate's Degree Graduates from Maryland's Community Colleges* report by providing results by Associate's degree type and major for select tables in the primary report. An additional supplement is available on outcomes by college.

Report Objectives

The primary and supplemental reports explore the outcomes for Associate's degree graduates from Maryland's community colleges five years after degree attainment. Specifically, the reports explore:

1. Wages earned; and
2. Industry of employment.

This report explores those objectives by degree type and major.

Research Agenda Questions

All research conducted by the MLDS Center focuses on what happens to students before and after critical transitions between education and workforce pathways. All research and analysis using the MLDS is cross-sector. MLDS Center research is guided by a Research Agenda. This report is responsive to the following Maryland Longitudinal Data System Center research agenda questions:

- What happens to students who start at community colleges and do not go on to 4-year institutions?
- Are exiters of Maryland colleges successful in the workforce?

MLDS Data

The MLDS is the State's central repository for student and workforce data. The MLDS Center develops and maintains the System in order to provide analyses, produce relevant information, and inform choices to improve student and workforce outcomes in the State of Maryland. The MLDS System connects data from across Maryland's education and workforce agencies. These data are subject to strict data management, security, and privacy requirements. The MLDS may only report aggregated, de-identified data.

This analysis focuses on the employment of individuals as they move from earning their Associate's degree into the workforce, including whether or not any of the graduates enrolled in college or earned another college degree subsequent to graduation. Below is an overview of the available data within the System to support this analysis:

[1]Maryland Higher Education Commission. (2015). Data Book.

Education Data

The MLDS System contains education data on all students from Maryland's public schools, community colleges, 4-year public institutions and state-aided independent institutions. Education data begin with the 2007-2008 academic year and are current through the 2018-2019 academic year. The System does not contain education data on students in private high schools or private institutions of higher education. Nor does the System contain data on postsecondary students in continuing education or non-credit programs. The System contains limited information out-of-state college enrollment and graduation for Maryland public high school graduates.

Wage Data

The MLDS workforce data include quarterly Unemployment Insurance (UI) wages from 2008 through the third quarter of 2019. Unemployment Insurance (UI) filings are only available for employees who work for a business required to file UI. UI wages reflect the sum of all compensation. For some records, wages include bonuses, commissions, tips and other forms of compensation. Bonuses and other forms of compensation are periodic and may cause fluctuations in earnings. Wages reflect the period the compensation was paid, not when the compensation was earned. The wage data contained in the System cannot distinguish between part-time and full-time employment, hourly and salaried wages, regular wages and commissions, bonuses and other incentive pay. The UI data provided do not indicate the number of days a person worked in a particular quarter or the number of hours a person worked in a week.

The federal government (including the military), certain non-profits, and self-employed and independent contractors are not subject to Maryland UI filings. Individuals working in temporary employment, including federal postsecondary work-study programs, are also not subject to UI filings. MLDSC data do not include information on out-of-state employment. These data gaps mean it is incorrect to assume that individuals not counted as "employed" in this report are unemployed.

Wage data in the System include North American Industry Classification System (NAICS) codes for employers. This system classifies employers by sector rather than identifies the specific jobs performed by employees.

Contextual Data: MIT Living Wage Calculator

The Living Wage Calculator developed by the Massachusetts Institute of Technology[2] provides data on the cost of living in various geographic areas across the United States. The living wage calculator incorporates the cost of food, housing, health insurance, transportation, taxes, clothing and other personal items to derive the minimum annual income required for basic self-sufficiency. It is more comprehensive than traditional poverty measures, which do not

[2]Glasmeier, Amy K. (2018). Living Wage Calculator. (http://livingwage.mit.edu/) Massachusetts Institute of Technology.

incorporate these broader costs of living. More information on the MIT Living Wage Calculator is available on their website. The measure selected for from the Living Wage Calculator was "required annual income before taxes" for one adult with no dependent children. This wage was $31,365 annually or $7,841[3] per fiscal quarter for the State of Maryland in 2018. This income was converted to a quarterly income to align to the MLDS quarterly wage data and is referred to as the "living wage" in the remainder of this analysis. Living wages were also derived from this measure for each county in the state.

[3]Values reported in the Living Wage Calculator were $31,365 annually in 2018 dollars. This was divided to a quarterly wage of $7,841 in 2018 dollars. This value did not need to be adjusted for inflation as it is contemporary to the period under study.

Population of Interest

The population of interest was graduates of Maryland's community colleges who earned their Associate's degree between July 2012 and June 2013. Slightly more than 12,000 unique students earned Associate's degree during this period. See **Table 1**. The Associate's degree graduates were disaggregated into groups by degree type (Career or Transfer) and subsequent educational attainment. Two-thirds of the graduates earned an Associate's degree classified as a transfer degree, or a degree that is intended to prepare students to pursue a Bachelor's degree. One-third earned an Associate's degree intended to prepare graduates to directly enter the workforce. See **Appendix 1** for additional information on assignment to educational groups and degree types.

Table 1. Associate's Degree Graduates, State of Maryland, 2012-2013, Educational Attainment by Associate's Degree Type, Five Years after Graduation

Educational Attainment	Total	Career Degrees		Transfer Degrees	
		#	%	#	%
Associate's Degree Only	4,453	2,378	53%	2,075	47%
Associate's Degree with Some College	2,036	655	32%	1,381	68%
Associate's Degree Still in College	2,126	619	29%	1,507	71%
Associate's Degree with Additional Lower Division Degree	583	286	49%	297	51%
Certificate	*297*	*223*	*75%*	*74*	*25%*
Associate's	*286*	*63*	*22%*	*223*	*78%*
Associate's Degree with Bachelor's or Higher Degree	3,411	649	19%	2,762	81%
Bachelor's Degree	*3,189*	*586*	*18%*	*2,603*	*82%*
Graduate Degree	*222*	*63*	*28%*	*159*	*72%*
Total	**12,609**	**4,587**	**36%**	**8,022**	**64%**

A little more than half of graduates with Career degrees did not continue to pursue postsecondary education in the five year period after earning an Associate's degree, while the other half continued to pursue additional postsecondary education, with 14% earning a Bachelor's degree or higher within five years of the Associate's degree. See **Table 2**. Only 26% of graduates with Transfer degrees did *not* continue to pursue postsecondary education after earning an Associate's degree. Over one-third did pursue and finish a Bachelor's degree or higher within five years of graduation while an additional 19% were still enrolled pursuing additional postsecondary credentials.

Table 2. Associate's Degree Graduates, State of Maryland, 2012-2013, Associate's Degree Type by Educational Attainment, Five Years after Graduation

Educational Attainment	Total	Associate's Degree Only		Some College		Still in College		Additional Lower Division Degree		Bachelor's or Higher Degree	
All Associate's Degrees	*12,609*	*4,453*	*35%*	*2,036*	*16%*	*2,216*	*17%*	*583*	*5%*	*3,411*	*27%*
Career Degrees	4,587	2,378	52%	655	14%	619	13%	286	6%	649	14%
Transfer Degrees	8,022	2,075	26%	1,381	17%	1,507	19%	297	4%	2,762	34%

ANALYSIS AND RESULTS

Question 1. Wages Earned Five Years after Graduation

This section outlines the approach used to analyze wage data, calculate median quarterly wages, and construct income bands for Associate's degree graduates five years after graduating from a Maryland community college.

Median Wage Methodology

The Associate's degree graduates included in the wage analysis were selected by using the U. S. Census Bureau Stable or Full-Quarter Employment Methodology (referenced as Full-Quarter throughout this supplement)[4]. This methodology excludes individuals from analysis who do not have wage data in both the fiscal quarters before and after the period of interest. The Full-Quarter Employment Methodology was selected because it provides a standardized method of determining whose wages to include in the analysis. Restricting the analysis to full-quarter wage earners provides a clear picture of wage outcomes for workers fully engaged in the workforce and eliminates the potential to deflate median wage calculations by including the wages, or lack of wages, for workers who are absent, transient, or not fully engaged in the workforce. The primary report discusses issues related to Associate's degree graduates that may not be fully engaged in the workforce or have limited wage data available for analysis.

For this study, the period of interest was the 20th quarter, or five years after earning an Associate's degree from a Maryland community college. Accordingly, graduates were included in the wage analysis[5] if, in addition to having wages in the 20th quarter, they also had wages in the 19th and 21st quarters. The median quarterly wage was then derived from the 20th quarter wage. The median quarterly wage was derived for the entire cohort of graduates with full-quarter wages as well as for each educational attainment group.

Wage bands were constructed to align to the contextual indicator selected for this report. The wages earned in the 20th quarter for those with full-quarter employment were used to assign each graduate to one of two wage groups. See **Table 3**.

Table 3. Quarterly Wage Bands

Income Band	20th Fiscal Quarter Wage
Less than Minimum Wage	$1 to $3,608
Between Minimum Wage and Living Wage	$3,609 to $7,841
Between the Living Wage and ACS Wage	$7,842 to $10,872
Greater than or equal to the ACS Wage	>= $10,872

[4]The Full-Quarter or Stable Employment methodology is utilized by the U. S. Census Bureau to calculate average monthly earnings for individuals engaged in stable employment with any employer. The methodology is applied here to derive quarterly, rather than monthly median earnings. https://lehd.ces.census.gov/doc/QWI_101.pdf.

[5]Some individuals have wages in a quarter from more than one employer. Those wages were summed and then the sum was used in the median quarterly wage calculation.

Associate's degree graduation dates occurred throughout the entire 12 month period of July 2012 to June 2013. The table below provides the alignment of degree date to the 20th quarter used for this report. This alignment means that some graduates who completed their degree in the first or second month of the fiscal quarter have an additional 4 to 8 weeks of time between degree attainment and the start of the 20th fiscal quarter to secure post-degree employment as compared to those who earn their degrees at the end of period. See **Table 4.**

Table 4. Associate's Degree Graduation Date to Fiscal Quarter Alignment

Associate's Degree Graduation Semester	20th Fiscal Quarter	Months in Fiscal Quarter
Summer 2012 (Graduation July to September)	Q2 2017	April-May-June
Fall 2012 (Graduation October to December	Q3 2017	July-August-September
Spring 2013 (Graduation January to March)	Q4 2017	October-November-December
Spring 2013 (Graduation April to June)	Q1 2018	January-February-March

Results

There were 7,228 Associate's degree graduates, or 57% of all graduates, who met the definition for full-quarter employment and were therefore included in this wage analysis. Graduates with Career degrees were slightly more visible (61%) in the wage data than those with Transfer degrees (55%). See **Table 5**[6]. Graduates excluded from this analysis include individuals who may have had wage data for some but not all of the quarters required to meet the full-quarter employment definition, who may have had wages from a source not reported to the MLDS (contractors, military personnel and federal employees), who may have been working out-of-state, or who may have been unemployed.

Table 5. Associate's Degree Graduates, State of Maryland, 2012-2013, Graduates with Full-Quarter Wages by Degree Type, Five Years after Graduation

Educational Attainment	Total	Total with Full-Quarter Wages	% with Full Quarter Wages	Median Quarterly Wage	Variation to Living Wage ($7,841)
All Associate's Degrees	*12,609*	*7,228*	*57%*	*$10,967*	↑ *$3,126*
Career Degrees	4,587	2,793	61%	$13,408	↑ $5,567
Transfer Degrees	8,022	4,435	55%	$9,816	↑ $1,975

Overall, Associate's degree graduates had a median quarterly wage of $10,967 five years after graduation, a wage that was $3,126 more than the living wage in Maryland. See **Table 5**. The median quarterly wage for graduates with Career degrees was $2,441 higher than the overall median, and $3,952 higher than the median for those with Transfer degree.

The differences in wage visibility and median quarterly wages between the two degree types may be partially attributable to the ability of graduates to fully engage in career-track employment after graduation. It is worth noting that the majority of Career degree graduates did not continue a postsecondary education, while the majority of Transfer degree graduates did. In fact, 52% of Career degree graduates were fully available to pursue career-track employment immediately following graduation allowing five full years to build work histories and earn progressively higher wages, compared to 26% of Transfer degree graduates. See **Table 2**. Conversely, 38% of Transfer degree graduates pursued postsecondary education, earning an additional degree, compared to 20% of Career degree graduates who earned a second degree within five years.

Another way to analyze wages five years after graduating with an Associate's degree is to determine the number of graduates with wages in each of the wage bands. The median quarterly wage identifies the quarterly wage in the exact middle of a population; half the records in that population have a quarterly wage above this value, and half the records have a quarterly wage below this value. Identifying the number of Associate's degree graduates with quarterly wages in each wage bands helps quantify the number of graduates that are engaged in the workforce at a level that provides for or exceeds the basic cost of living in Maryland.

[6]Wages are actual for Q2 2017, Q3 2017, Q4 2017 and Q1 2018 and not inflation adjusted to current day values. If an individual had more than one source of wages for the period those sources were summed to a personal quarterly wage and that value was used in determining the median.

Overall, 70% of all Associate's degree graduates with full-quarter employment had quarterly wages at or above the living wage while 30% were below the quarterly living wage. See **Table 6**. This rate was higher for Career degrees (80%) than Transfer degrees (65%).

Table 6. Associate's Degree Graduates with Full Quarter Wages, State of Maryland, 2012-2013, Graduates by Degree Type and Wage Band, Five Years after Graduation

Education Level	Total with Full-Quarter Wages	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	%	#	%	#	%	#	%
All Associate's Degrees	*7,228*	*648*	*9%*	*1,505*	*21%*	*1,411*	*20%*	*3,664*	*51%*
Career Degrees	*2,793*	178	6%	401	14%	412	15%	1,802	65%
Transfer Degrees	*4,435*	470	11%	1,104	25%	999	23%	1,863	42%

Further, the median quarterly wages for Career degree graduates was higher at all levels of subsequent educational attainment. See **Table 7**. Noteworthy are the differences between medians in the Associate's Only and Bachelor's or Higher groups. The Career degrees are approximately $4,000 and $3,000 higher respectively, despite these groups both having equal time post-degree in the workforce. When annualized, the Career degree yields between $12,000 and $16,000 more per year than the Transfer degree.

Table 7. Associate's Degree Graduates with Full-Quarter Wages, State of Maryland, 2012-2013, Median Quarterly Wages by Degree Type and Educational Attainment, Five Years after Graduation

Degree Type	All Associate's		Associate's Degree Only		Some College		Still in College		Lower Division Degree		Bachelor's or Higher	
	n	Median Quarterly Wage	n	Median Quarterly Wage	n	Median Quarterly Wage	n	Median Quarterly Wage	n	Median Quarterly Wage	n	Median Quarterly Wage
All Associate's	7,228	$10,967	2,195	$11,780	1,144	$9,874	1,404	$9,734	375	$12,711	2,110	$11,247
Career Graduates	2,793	$13,408	1,343	$13,749	428	$12,627	431	$12,459	187	$13,771	404	$13,778
Transfer Graduates	4,435	$9,828	852	$9,295	716	$8,674	973	$8,847	187	$12,103	1,707	$10,798

The differences in wage distributions and median quarterly wages may be attributable to a second factor: college major. Career degrees provide coursework that is aligned to entry-level workforce needs. Transfer degrees provide broad-based foundational coursework aligned to an academic discipline to prepare students for the advanced coursework to be completed in a Bachelor's degree.

Career degree graduates were concentrated in Health majors (51%) where the median quarterly wages was $14,884, a rate twice the living wage, and 85% of the full-quarter graduates had a quarterly wage above the living wage. See **Table 8**. Comparatively, Transfer degree graduates were concentrate in General Studies (57%) where the median quarterly wage was $9,392, a wage $1,500 higher than the living wage, and 62% of full-quarter graduates had a quarterly wage above the living wage.

Table 8. Associate's Degree Graduates, State of Maryland, 2012-2013, Graduates with Full-Quarter Wages and Median Quarterly Wages by Degree Type, Five Years after Graduation

HEGIS Group	Total Graduates	% in Major	# Full-Quarter Wages	% with Full-Quarter Wages	Median Quarterly Wage	# Above Living Wage	% Above Living Wage ($7,841)
Statewide	12,609		7,228	57%	$13,512	5,075	70%
Career Degrees	4,587		2,793	61%	$13,408	2,214	79%
Business & Commerce	865	19%	457	53%	$10,249	308	67%
Data Processing	460	10%	259	56%	$12,758	204	79%
Health	*2,355*	*51%*	*1,560*	*66%*	*$14,884*	*1,331*	*85%*
Mechanical & Engineering	263	6%	149	57%	$13,250	116	78%
Natural Science	80	2%	48	60%	$10,091	29	60%
Public Service	564	12%	320	57%	$10,200	226	71%
Transfer Degrees	8,022		4,435	55%	$9,816	2,861	65%
Arts and Science	1,517	19%	835	55%	$8,729	481	58%
Humanities & Social Science	115	1%	72	63%	$7,717	35	49%
Engineering	190	2%	96	51%	$15,674	84	88%
General Studies	*4,553*	*57%*	*2,497*	*55%*	*$9,392*	*1,547*	*62%*
Teacher Education	422	5%	310	73%	$10,904	210	68%
Business Administration	1,124	14%	583	52%	$11,644	470	81%
Computer Science	101	1%	42	42%	$13,706	34	81%

Despite the differences in median quarterly wages and the number of graduates above the living wage, it is noteworthy that all majors, with the exception of *Humanities & Social Science*, had median quarterly wages $1,000 to $8,000 above the living wage with the majority of each group above the living wage (49% to 88%). Equally noteworthy is that all graduates are highly visible in the wage date, with between 42% and 73% engaged in the workforce for nine months five years after graduation. This includes graduates in *Teacher Education* transfer degrees. While only 5% of Transfer degree graduates were in *Teacher Education*, 73% were visible in the labor data five years after graduation (the highest rate of visibility), while out of the thirteen majors it ranked seventh for percentage of population above living wage (68%) and the median quarterly wage ($10,904). Other majors in business and STEM had lower visibilities, but higher median quarterly wages and percentages of population above the living wage.

Question 2. Industry of Employment Five Years after Graduating with an Associate's Degree

This section outlines the approach used to analyze the industry of employment and corresponding wages for Associate's degree graduates five years after graduation.

Methodology

The industry of employment was determine by evaluating the North American Industry Classification System (NAICS) code reported with each wage record. NAICS codes were grouped according to standard reporting categories.[7] The U. S. Census Bureau Stable Employment Methodology[8] was used as a basis for selecting Associate's degree graduates to include in the analysis with the added requirement that they must have been employed by the same employer for the nine month period before deriving median wage calculations for the 20th quarter[9] (referenced as Same-Employer throughout this report).

[7]The 20 NAICS codes were grouped based upon industry sector as aligned to Bureau of Labor Statistics and U.S. Statistical Agencies Office of Management and Budget (Federal), Economic Classification Policy Committee.
[8]The Full-Quarter Employment (Stable) methodology is utilized by the U. S. Census Bureau to calculate average monthly earnings for individuals engaged in stable employment with the same employer. The methodology applied here derives quarterly, rather than monthly, median earnings.
https://lehd.ces.census.gov/doc/QWI_101.pdf.
[9]For the NAICS quarterly median wage calculation, some individuals had wages in the quarter from more than one employer and more than one NAICS. Only wages from the employer that covered all three quarters were used in median wage calculations. 490 graduates had the same employer however, the employer changed NAICS over the course of 19th, 20th and 21st quarters. The NAICS of the 20th quarter were selected for these graduates. Additionally, 84 graduates had employment in the same NAICS for all three quarters, but, with different employers. These graduates were omitted from the analysis.
[9]The 20 NAICS codes were grouped based upon industry sector as aligned to Bureau of Labor Statistics and U.S. Statistical Agencies Office of Management and Budget (Federal), Economic Classification Policy Committee.
[9]The Full-Quarter Employment (Stable) methodology is utilized by the U. S. Census Bureau to calculate average monthly earnings for individuals engaged in stable employment with the same employer. The methodology applied here derives quarterly, rather than monthly, median earnings.
https://lehd.ces.census.gov/doc/QWI_101.pdf.

Results

The Full-Quarter Employment with Same-Employer Methodology (Same-Employer) yielded 6,738 Associate's degree graduates for analysis. This is 53% of all graduates, and 93% of all graduates with full-quarter employment. See **Table 9**. This means that 93% of all Associate's degree graduates with full-quarter employment had wages from the same employer for all three fiscal quarters; only 7% of graduates with full-quarter employment changed employers at least once during this period. The rate of full-quarter graduates with same-employer wages was slightly higher for Career degrees than Transfer degrees.

Table 9. Associate's Degree Graduates, State of Maryland, 2012-2013, Graduates with Full-Quarter and Same-Employer Wages, Five Years after Graduation

Educational Attainment	Total	Total with Full-Quarter Wages	% with Full Quarter Wages	Same-Employer Wages	% Same-Employer Wages	% of Full-Quarter with Same-Employer Wages
All Associate's Degrees	*12,609*	*7,228*	*57%*	*6,738*	*53%*	*93%*
Career Associate's Degree	4,587	2,793	61%	2,641	58%	95%
Transfer Associate's Degree	8,022	4,435	55%	4,097	51%	92%

Overall, 71% of *Same-Employer* Associate's degree graduates had a median quarterly wage that was above the living wage. See **Table 10**. This rate was nineteen percentage points higher for Career degrees than Transfer degrees. As previously noted, this difference may be attributable the fact that the majority of Career degree graduates did not continue a postsecondary education and were fully available to pursue career-track employment immediately following graduation, building work histories and earning progressively higher wages. The majority of Transfer degree graduates pursued postsecondary education limiting their time in career-track employment.

Table 10. Associate's Degree Graduates with Same-Employer Wages, State of Maryland, 2012-2013, Industry of Employment and Median Quarterly Wages Compared to Living Wage, Five Years after Graduation

Educational Attainment	Graduates with Full-Quarter Same-Employer Wages	Median Quarterly Wage	# Above Living Wage	% Above Living Wage ($7,841)
All Associate's Degrees	*6,738*	*$11,154*	*4,817*	*71%*
Career Associate's Degree	2,641	$13,512	2,105	80%
Transfer Associate's Degree	4,097	$10,028	2,712	61%

The median quarterly wage for graduates with *Same-Employer* wages varied by sector of employment. See **Table 11.** For all sectors, the median quarterly wage was higher for Career degrees than Transfer degrees. The limitations of the wage data make it difficult to interpret the differences between group median quarterly wages. Wage data provide the sector of the employer rather than the job of the employee. The wage differentials that appear to exist between degree type groups may be attributable to the wide range of positions within each industry, positions feed by different types of majors.

Table 11. Associate's Degree Graduates with Same-Employer Wages, State of Maryland, 2012-2013, Industry of Employment and Median Quarterly Wages by Degree Type, Five Years after Graduation

	All Same-Employer Wages		Career Degree Same-Employer Wages		Transfer Degree Same-Employer Wages	
NAICS Group	#	Median Quarterly Wage	#	Median Quarterly Wage	#	Median Quarterly Wage
Statewide	6,738	$11,154	2,641	$13,512	4,097	$10,028
Goods Production	380	$12,004	116	$12,745	264	$11,843
Trade, Transportation, & Utilities	848	$8,203	222	$8,539	626	$8,107
Information	104	$11,801	32	$12,858	72	$11,655
Financial Activities	404	$11,876	118	$12,828	286	$11,616
Professional & Business Services	1,072	$11,891	334	$13,258	738	$11,370
Education & Health Services	2,928	$12,131	1,494	$14,501	1,434	$10,147
Leisure and Hospitality	380	$6,351	76	$7,677	304	$6,000
Other Services	189	$8,434	46	$11,576	143	$7,789
Public Administration	433	$11,780	203	$12,740	230	$10,789

The first and second largest industries for Career degrees was *Education & Health Services* and *Professional & Business Services.* See **Table 12.** Median quarterly wages ranged from $8,150 to $15,327 in *Education & Health Services* and $11,036 to $15,750 for *Professional & Business Services*, depending on the college major. The results were similar for Transfer degrees. See **Table 13.** Median quarterly wages ranged from $7,658 to $11,334 in *Education & Health Services* and $7,281 to $16,065 for *Professional & Business Services*, depending on the college major.

Table 12. Career Associate's Degree Graduates with Same-Employer Wages, State of Maryland, 2012-2013, Industry of Employment and Median Quarterly Wages, Five Years after Graduation

HEGIS Group	All Graduates	Same Employer Wages	Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	All Other Industries
Statewide	12,609	6,738	$11,154	Education & Health Services n=2,928 $12,131	Professional & Business Services n=1,072 $11,891	Trade, Transportation, & Utilities n=848 $8,203	n=1,890
Career Degrees	4,587	2,641	$13,512	Education & Health Services n=1,494 $14,501	Professional & Business Services n=334 $13,258	Trade, Transportation, & Utilities n=222 $8,539	n=591
Business & Commerce	865	423	$10,571	Education & Health Services n=99 $9,069	Professional & Business Services n=87 $12,237	Trade, Transportation, & Utilities n=73 $8,816	n=164
Data Processing	460	242	$12,724	Professional & Business Services n=69 $15,750	Education & Health Services n=48 $11,654	Trade, Transportation, & Utilities n=44 $7,535	n=81
Health	2,355	1,481	$15,004	Education & Health Services n = 1,235 $15,327	Professional & Business Services n=82 $14,311	Public Administration n=55 $13,723	n=109
Mechanical and Engineering	263	143	$13,261	Professional & Business Services n=41 $14,308	Trade, Transportation, & Utilities n=39 $15,440	Goods Production n=28 $14,954	n=35
Natural Science	80	45	$10,117	Professional & Business Services n=15 $12,498	Education & Health Services n=10 $10,632	Public Administration n=10 $10,065	n=10
Public Service	564	307	$10,303	Public Administration n=90 $14,268	Education & Health Services n=87 $8,150	Professional & Business Services n=40 $11,036	n=90

Table 13. Transfer Associate's Degree Graduates with Same-Employer Wages, State of Maryland, 2012-2013, Industry of Employment and Median Quarterly Wages, Five Years after Graduation

HEGIS Group	All Graduates	Same Employer Wages	Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	Industry # in Industry Median Quarterly Wage	All Other Industries
Statewide	12,609	6,738	$11,154	Education & Health Services n=2,928 $12,131	Professional & Business Services n=1,072 $11,891	Trade, Transportation, & Utilities n=848 $8,203	n=1,890
Transfer Degrees	8,022	4,097	$10,028	Education & Health Services n=1,434 $10,147	Professional & Business Services n=738 $11,370	Trade, Transportation, Utilities n=626 $8,107	n=1,299
Arts and Science	1,517	779	$8,904	Education & Health Services n=264 $8,926	Professional & Business Services n=124 $10,196	Trade, Transportation, & Utilities n=116 $6,540	n=275
Humanities and Social Science	115	65	$8,077	Education & Health Services n=19 $7,658	Trade, Transportation, & Utilities n=12 $ 7,908	Professional & Business Services n=10 $7,281	n=24
Engineering	190	87	$16,430	Professional & Business Services n=40 $16,065	Goods Production n=21 $17,174	Trade, Transportation, & Utilities n=15 $18,518	n=11
General Studies	4,553	2,282	$9,651	Education & Health Services n=832 $9,939	Professional & Business Services n=390 $10,813	Trade, Transportation, & Utilities n=363 $7,900	n=697
Teacher Education	422	303	$10,958	Education & Health Services n=235 $11,334	Trade, Transportation, & Utilities n=15 $5,954	Professional & Business Services n=14 $7,715	n=39
Business Administration	1,124	541	$11,760	Professional & Business Services n=142 $13,116	Trade, Transportation, & Utilities n=98 $9,153	Financial Activities n=85 $13,205	n=216
Computer Science	101	40	$13,433	Professional & Business Services n=19 $13,857	Trade, Transportation, & Utilities n=* $6,795	Goods Production n=* $13,825	n=*

* indicates value is suppressed to protect unauthorized disclosure of protected information.

Conclusions

The analysis in this supplemental report demonstrates that wages are lower for Associate's degree graduates with Transfer degrees than those with Career degrees. However, the majority of graduates from both groups who were fully engaged in the workforce have earnings sufficient to meet the basic costs of living in Maryland. Some of these differences may be attributable to the major and the focus of the degree. Transfer degrees align to academic disciplines and provide foundational knowledge to pursue additional education rather specific workforce competencies needed to enter the labor market. The earnings reported here represent early career wages, it is possible that the differences in wages between the two groups may change with career progression, widening, closing or reversing the gaps.

It is important to note that the analysis presented here was conducted across a population that may be in very different career stages. As noted on the full report, the majority of Associate's degree graduates were between the ages of 18 and 24, and at the early stages of a career. These graduates may be entering the workforce for the first time, resulting in lower wages during the first two or three years of employment after graduation. The other half of the graduates were over 25 at the time of graduation and are likely to be very different in terms of previous work history than the younger group. Some of these graduates may be career changers who pursued training to enter a new career sector, perhaps from a job that is no longer part of the modern workforce. Others may be established in their careers but seeking skills for career advancement.

This report demonstrates that an Associate's degree can provide a meaningful return on investment. The average in-county tuition and fees for completing an Associate's degree in Maryland in 2012-2013 was $7,400[10]. For this investment, five years after earning the degree, the median quarterly wage for an Associate's degree graduate was $10,967 or approximately $43,000 per year. Comparatively, the median quarterly wage for a Maryland high school graduate who does not continue on to college was $5,931[11] or approximately $24,000 per year, five years after high school. This means that a high school graduate who invests $7,400 in tuition and fees to earn an Associate's degree has the potential to earn twice as much as a high school graduate who directly enters the workforce without additional postsecondary education.

[10] Maryland Higher Education Commission. (2015). Data Book.

[11] MLDS Center. (2019). Career Preparation Expansion Act: Annual Report to the General Assembly and Governor Larry Hogan. Baltimore, MD: Maryland Longitudinal Data System Center.

APPENDIX

Degree Type and Educational Attainment Methodology

Degree Type

When a Maryland college or university seeks to offer an academic program, the Maryland Higher Education Commission (MHEC) assigns a Higher Education General Information Survey (HEGIS) code and Classification of Instructional Programs (CIP) code upon approval or recommendation to implement the program. Six digit HEGIS codes are assigned based upon program, degree level and degree type. Typically, HEGIS codes in the range of 01 to 23 indicates a program offered at the baccalaureate level or higher, 49 indicates a transfer degree program offered at community colleges, 50 to 56 indicates a career degree program offered at community colleges, and 90 indicates an undeclared program.

Due to the limitations of the HEGIS coding scheme, a HEGIS code may not always uniquely identify a program as the code does not always distinguish between variations in curriculum across institutions or within the same institution. For example, HEGIS code 089901 identifies Agricultural Education at one college and Health Professions Education at another. Depending on the CIP code assigned in the academic program inventory, it may not be possible to identify this variation in the MLDSC data.

Additionally, academic programs may have areas of concentrations. MHEC does not collect college enrollment and graduation information on areas of concentrations. Instead, MHEC collects information solely on the parent program. For example, the HEGIS code 491001 identifies all Arts & Sciences Transfer enrollments and degrees at the same institution even though individual students may complete an area of concentration in either: art, biology, business, chemistry, English, physics, or any of 14 possible concentrations.

The HEGIS code structure may limit uniquely identifying the program of study and may result in understating or overstating the number of enrollments and graduates for any one program across the State. For this study, HEGIS code was used as a blunt instrument to separate graduates by degree type. All graduates with a HEGIS code beginning with 49 were considered to have completed a transfer Associate's degree. Graduates with any other HEGIS code were considered as completing a career Associate's degree. As such, some graduates classified as career degrees may have completed transfer degrees and vice versa.

Educational Attainment

Educational attainment has the following important implications for workforce outcomes. First, research suggests that employment outcomes and wages may vary by level of educational attainment[12]. Second, Associate's degree graduates who pursued an additional college degree may be employed in part-time entry-level minimum-wage positions so they can prioritize college; comparatively Associate's degree graduates that did not pursue an additional college degree may have been available to enter the workforce in full-time career-track employment. Finally, the time to degree widely varies based upon the type the postsecondary degree. Certificate's, Associate's, and Bachelor's degree programs are designed to require one, two, or four years of full-time study respectively. The length of each program impacts the amount of time graduates may have been in the workforce after earning their Associate's degree. For example, Associate's degree graduates who earn a second Associate's degree may enter the workforce two years earlier than those that complete a Bachelor's degree. The time required to complete the additional degree is subject to transfer credit policies and the graduation requirements of the subsequent degree. If the student changes majors rather than continues in a major related to the first degree, the credit loss from transfer or major change may extend the time to degree.

Accordingly, separating the population of interest into groups by educational attainment helps identify wages differences that may occur when using a common point in time (five years after earning an Associate's degree) as a measure for a population who has had different amounts of time in the workforce. These distinctions in educational attainment should not be interpreted as college graduation rates as this report does not provide the starting number of students entering each educational attainment category, only the number of students who obtained each degree, are still enrolled in college, or stopped attending college without graduating. Reporting on time to degree and college completion rates is outside the scope of this report.

For this report, the following five educational groups were created for wage analysis. See **Figure 1** and **Table 1** in the report for distributions. Education attainment definitions:

1. **Associate's Degree Only**: Associate's degree graduates with no additional postsecondary degree or college enrollment record by the end of spring term 2017. Note, a small number of graduates earned two Associate's degree concurrently or an Associate's and a Certificate concurrently rather than a single Associate's degree.
2. **Associate's Degree with Some College**: Associate's degree graduates enrolled for at least one term between fall 2012 and fall 2016 but who did not earn a postsecondary degree and are not actively enrolled in college in the spring 2017 or fall 2017 terms.
3. **Associate's Degree Still in College**: Associate's degree graduates enrolled in college in the spring 2017 and/or fall 2017 terms. These graduates may have earned another postsecondary degree

[12]For example, see:

Baum, Sandy, Jennifer Ma and Kathleen Payea. (2013). Education Pays 2013: The benefits of higher education for individuals and society. College Board.

Hout, Michael. (2012). Social and economic returns to college education in the United States. Annual Review of Sociology. 38: 379-400.

Kane, T.J. and Rouse, C. E. (1995). Labor market returns to two-year and four-year college. The American Economic Review, 85(3): 600-614

Thomas, Scott L. and Liang Zhang. (2005). Post-baccalaureate wage growth within 4 years of graduation: The effects of college quality and college major. Research in Higher Education. Volume 46. 4: 437-459.

by the end of the fall 2016 term; however, they are still actively pursuing additional postsecondary education in the spring 2017 and/or fall 2017 terms.

4. **Associate's Degree with Additional Lower Division Degree:** Associate's degree graduates who earned another Associate's degree or a Certificate degree by the end of the fall term 2016 and are not enrolled in college in the spring 2017 or fall 2017 terms. Additionally, the category includes any Associate's degree graduates that obtained an Associate's degree or Certificate PRIOR to earning the Associates degree included in this study.
5. **Associate's Degree with Bachelor's or Higher Degree**: Associate's degree graduates who earn a Bachelor's degree, Master's degree, or other degree above the baccalaureate level by the end of the fall term 2016 and are not enrolled in college in the spring 2017 or fall 2017 terms.

Note, some Associate's degree graduates received more than one degree during the five year period. Each graduate is counted only once, based upon highest degree attained or their enrollment status at the five year evaluation period. For example, if an Associate's degree graduate completed an additional Associate's degree and then a Bachelor's degree, the graduate is counted in the Bachelor's category. Other Associate's degree graduates that completed another Associate's degree but were still progressing toward an additional degree were counted in the Still in College category rather than in the Associate's Degree with Additional Lower Division Degree category. Due to data limitations, it is possible that some Associate's degree graduates earned a postsecondary credential prior to data contained within the MLDS Center System or completed a postsecondary degree out-of-state pre or post the Associate's degree.

The matrix below provides the alignment of Associate's degree graduation date to the academic period used to evaluate subsequent postsecondary activity and the final academic period consider for evaluating if a graduate had earned an additional degree or was still enrolled in college. Any Associate's degree graduate that did not earn a postsecondary degree in the last academic period of evaluation that was not enrolled in the academic period of the 20th fiscal quarter was considered no longer progressing and classified as Some College.

The decision to use these cut-offs for placement into an educational attainment category was made to allow students in each category time to transition from college to workforce and thus provide a more accurate picture of wages and industry of employment after college.

Table A. Associate's Degree Graduation Dates Aligned to Evaluation Periods

Associate's Degree Graduation Dates	Last Academic Period Evaluated for College Degree Attainment	Academic Period at 20th Fiscal Quarter	20th Fiscal Quarter
July, August or September 2012	Fall 2016	Spring 2017	Q2 2017
October, November or December 2012	Spring 2017	Fall 2017	Q3 2017
January, February or March 2013	Spring 2017	Fall 2017	Q4 2017
April, May or June 2013	Fall 2017	Spring 2018	Q1 2018