MLDS Center
Maryland Longitudinal Data System

Better Data • Informed Choices • Improved Results

May 2017

Workforce Outcomes in Maryland for Students Who Do Not Attend College: Patterns Among Students Who Earn a High School Diploma, Certificate of Completion, Diploma via GED, and High School Non-Completers

Submitted by:

Maryland Longitudinal Data System Center

Ross Goldstein, Executive Director
Terry V. Shaw, Ph.D., Principal Investigator
Angela K. Henneberger, Ph.D., Director of Research

Authored by:

Terry V. Shaw, Ph.D.
Susan Klumpner, AM
Angela K. Henneberger, Ph.D.

University of Maryland, Baltimore

Maryland Longitudinal Data System Center
550 West Baltimore Street
Baltimore, MD 21201
410-706-2085
mlds.center@maryland.gov
http://mldscenter.maryland.gov/

Ross Goldstein
Executive Director

James D. Fielder, Jr., Ph.D.
Secretary of Higher Education,
Chair, MLDS Governing Board

Larry Hogan
Governor

Suggested Citation

Shaw, T.V., Klumpner, S., & Henneberger, A.K. (2017). *Workforce Outcomes in Maryland for Students Who Do Not Attend College: Patterns Among Students Who Earn a High School Diploma, Certificate of Completion, Diploma via GED, and High School Non-Completers.* Baltimore, MD: Maryland Longitudinal Data System Center.

Acknowledgement

This report was prepared by the Research Branch of the Maryland Longitudinal Data System Center (MLDSC). The Research Branch would like to thank the entire staff of the MLDSC for their assistance with this report.

If you have questions regarding this publication, please contact mlds.center@maryland.gov.

Table of Contents

This page intentionally left blank

Executive Summary

This report focused on the workforce outcomes of Maryland regular high school diploma earners, certificate of completion earners, high school diploma via GED earners (ages 16-21 years), and high school non-completers in academic year 2009-2010 who did not attend college. Workforce wages were calculated using three methods. *Actual wages* were calculated by summing the wages the individual actually earned for all quarters during a year. *Annualized wages* were calculated by dividing the total amount of wages earned in the year by the number of quarters worked and multiplying by four. *Four-quarter wages* were calculated by summing all four quarters of wages only for the individuals who had wages in each of the four quarters during the year.

Calculating wages using the four-quarter method yielded the highest earnings, whereas calculating wages using the actual wages method yielded the lowest earnings. High school diploma earners who did not attend college earned the highest wages in the health care and social assistance and the other services (except public administration) industries. High school certificate of completion earners who did not attend college earned the highest wages in the administrative and support and waste management and remediation services industry. High school diploma via GED earners who did not attend college earned the highest wages in the construction, other services (except public administration), and health care and social assistance industries. High school non-completers earned the highest wages in the transportation and warehousing and health care and social assistance industries.

The findings of this report highlight the potential importance of encouraging students to complete high school with a regular high school diploma or high school diploma via GED. Additionally, targeted workforce training programs offered in high school that guide students toward higher paying industries (i.e., health care and social assistance) may be important for students who do not plan to enroll in college.

This page intentionally left blank

Introduction

This report focuses on the workforce outcomes of Maryland students who do not attend college. This includes Maryland regular high school diploma earners (referred to as high school diploma), certificate of completion[1] earners, high school diploma through the GED[2] program earners (referred to as high school diploma via GED), and high school non-completers. The literature presented for this report includes the health, welfare, and crime costs associated with high school completion and non-completion for students who did not attend college; the workforce outcomes associated with high school completion and non-completion for students who did not attend college; and finally, student groups that are disproportionately impacted by high school completion and non-completion. Finally, we use data from the Maryland Longitudinal Data System (MLDS) to examine the wages earned and industries employing Maryland high school diploma earners, certificate of completion earners, high school diploma via GED earners, and high school non-completers, who do not go on to attend college.

Background

There are accumulating financial and social burdens for both individuals who do not complete high school and for those who complete high school but are not fully engaged in the workforce. These burdens can be grouped into two broad categories: health and welfare costs and workforce outcomes. Health and welfare costs include health care costs, overall mortality and morbidity, access to social support services, and criminal justice involvement. Workforce outcomes include workforce participation and the ability of an individual to contribute to society through state and local tax systems.

Health, Welfare, and Crime Costs Associated with High School Non-Completion

Using data from national surveys Belfield, Levin, and Rosen (2012) identified students who did not complete high school or completed high school but had limited engagement in the workforce as "opportunity youth." "Opportunity youth" are youth between the ages of 16 and 24 who are neither enrolled in school (high school or college) nor are they participants in the labor market, meaning they are neither increasing their human capital nor earning income (Belfield et al., 2012). These "opportunity youth" were found to impose significant social costs through their increased health care utilization, engagement with the criminal justice system, and participation in social support or welfare programs. The estimated lifetime social burden per youth is approximately $800,000 dollars. Belfield and colleagues suggested that in 2011 there were 6.7 million "opportunity youth" thus leading to a lifetime cost of $4.75 trillion dollars.

[1] A certificate of completion is generally used for students with Individualized Education Plans (IEPs). These students have not met state graduation requirements but still graduate with their class. It certifies attendance in high school. For more information, see https://answers.ed.gov/link/portal/28022/28025/Article/632/Certificate-of-Completion.

[2] The GED® test is a nationally recognized high school-equivalency test which allows students to earn a Maryland high school credential.

Research on health outcomes indicates that high school drop-outs were more likely to be diagnosed with nicotine dependence and more likely to report recent suicide attempts when compared to high school graduates (Maynard, Salas-Wright, & Vaughn, 2014). Students who received a GED were found to have comparable health outcomes to high school dropouts overall (Zajacova, 2012). An analysis using data from the National Health I Survey found that, compared to people who graduated from high school, non-graduates had higher rates of heart disease, lung cancer, and strokes, leading to an overall reduction in life expectancy of 9.2 years (Wong, Shapiro, Boscardin & Ettner, 2002). By encouraging students to attain an additional year of education to complete high school, overall lifetime health related costs could decrease by $83,238 per individual (Muennig, 2000). Muennig went on to postulate that the lifetime financial burden of health-related losses for high school dropouts would total $58 billion (Muennig, 2000). Over time, a high school dropout is predicted to receive almost $10,000 more in welfare payments than a high school graduate (Belfield et al., 2012).

High school dropouts were more likely to be engaged in certain criminal activities, including larceny, assault, and drug possession when compared to high school graduates (Maynard et al., 2014). Researchers have found an association between an increase in the number of years in the education system and reduced crime and societal costs. According to one analysis, increasing the high school completion rate by one percent for men ages 20-60 would decrease crime costs by approximately $1.4 billion per year (Levin, 2005; Moretti, 2005). Additionally, based on a study of states with mandatory high school attendance laws, it was estimated that a one-year increase in high school dropouts' attendance would greatly reduce charges such as murder, assault, and motor vehicle theft (Levin, 2005).

The research reviewed in this section presents a number of associations between high school credentials and health, welfare, and criminal outcomes. This research is correlational by nature, and we are unsure of the causal role of high school credentials in relation to differential health, welfare, and criminal outcomes. In all, the high social costs of high school non-completion suggest that investing in dropout prevention would be a good use of government resources. In the long run, spending money on short term social interventions that would help students to graduate from high school could save money that would otherwise be spent on future health, welfare, and criminal outcomes associated with high school non-completion (Levin, Belfield, Muennig, & Rouse, 2007).

Workforce Outcomes Associated with High School Non-Completion

Compared to high school completers, high school non-completers contribute less to workforce revenues (state and federal taxes) for a number of reasons. First, this group is less likely to be employed, either full or part-time, than high school graduates (Maynard et al., 2014). In fact, 45 percent of high school non-completers were not employed or enrolled in postsecondary education, compared to 8 percent of students who never dropped out of high school (Rumberger & Lamb, 2003). Rumberger and Lamb also reported that high school non-completers are often in "dead-end careers" meaning employment that did not offer

opportunities for advancement. However, Kim (2013) did find that almost a third were working toward more skilled employment.

Additionally, data from the U.S. Census Bureau analyzed by the National Center for Education Statistics (NCES) indicated that students who earn a high school diploma or GED earn considerably more than students who do not earn a high school diploma or GED. For example, full-time, year-round workers without a high school degree earned $25,000 in 2014, compared to $30,000 for those with a high school degree or equivalency credential such as the GED (Kena et al., 2016). National data also indicated that GED earners have lower earnings than those with a high school diploma, but higher than dropouts. In 2009, high school diploma earners made approximately $4,700 per month as compared to $3,100 for those with a GED (Ewert, 2012).

There are hidden costs that stem from a loss in earnings and taxes paid due to high school non-completion. These hidden costs have also been termed "opportunity costs", where loss calculations have varied from $235,680 (Belfield et al., 2012) to $260,000 (Rouse, 2005) per high school dropout over a lifetime. Furthermore, because a high school dropout's earning potential is less, this individual pays approximately $60,000 less in lifetime federal and state income taxes (Rouse, 2005). Annually, losses exceed $50 billion for all high school dropouts ages 18-67 (Levin, 2005). Therefore, from "opportunity costs" alone, the lifetime fiscal burden, debatably, costs $192 billion (Levin, 2005; Rouse, 2005) to upwards of $1.6 trillion (Belfield et al., 2012) across a cohort of high school dropouts. While there are discrepancies in estimations, it is clear that income losses pose an unintentional, yet significant fiscal burden to society that can be lessened by decreasing the number of students who do not complete high school and increasing the number of students who earn a high school diploma.

The research reviewed in this section presents a number of associations between high school credentials and workforce outcomes. This research is correlational by nature, and we are unsure of the causal role of high school credentials in relation to differential workforce outcomes. More research is needed to further examine the role of high school credentials in impacting workforce outcomes.

Non-Completion Affects Marginalized Social Groups Disproportionately

Student groups who have been historically marginalized are less likely to complete high school on time. The U.S. Department of Education reports Adjusted Cohort Graduation Rates (ACGR's), which attempt to reflect the proportion of each freshman class that graduates on time. In 2012-2013, 87% of white students and 89% of Asian/Pacific Islanders graduated on time (McFarland, Stark, & Cui, 2016). This is compared to 71% of Black students and 75% of Hispanic students. Low-income students had an on-time graduation rate of 73%, compared with the overall rate of 81%. Girls were also more likely to complete high school on time; an estimated 85% of females received a diploma in 2012-2013 within four years of entering high school, in contrast to only 79% of male students who graduated on time. In sum, national data indicated that male, Black, Hispanic and poor students were less likely than other students to graduate high school on time. After a high school student drops out, Black non-completers

were more likely to end up in "dead-end careers" when compared to white non-completers (Kim, 2013).

Research Questions

This report examines the workforce outcomes of Maryland regular high school diploma earners, certificate of completion earners, high school diploma via GED earners, and high school non-completers who did not attend college in order to respond to the following Maryland Longitudinal Data System Center (MLDSC) Research Agenda questions:

1. What are the workforce outcomes for Maryland students who earn a high school diploma (via high school graduation or GED) but do not transition to postsecondary education or training?
2. What are the workforce outcomes of Maryland high school non-completers?

Additionally, information is examined by various demographic characteristics, including: gender, race, ethnicity, and whether the student was eligible for free and reduced price meals[3] (FARMs).

Method

Population

The 2009-2010 cohort of 12th grade students was used for this report in order to have multiple years of longitudinal data following 12th grade to examine workforce outcomes. The 12th grade cohort of students was disaggregated by achievement type:

(1) diploma earners had earned a high school diploma by the end of the 2009-2010 academic year;
(2) certificate of completion earners had earned a certificate of completion by the end of the 2009-2010 academic year;
(3) students who persisted to a diploma did not earn a diploma at the end of the 2009-2010 academic year but eventually earned a high school diploma (see Uretsky, Henneberger, & Woolley, 2016);
(4) students who persisted to a GED/certificate of completion did not earn the GED/certificate of completion at the end of the 2009-2010 academic year, but eventually earned a GED/certificate of completion;
(5) non-completers included transfers, withdrawals, and all other outcomes including students in the 2009-2010 cohort of 12th grade students whose outcome was unknown.

Additionally, students (ages 16-21 years) who earned a high school diploma via the GED during the 2009-2010 academic year were identified.

[3] Eligibility for free and reduced price meals is used as a proxy for socio-economic status (SES).

A total of 65,000[4] 12th grade students were enrolled in Maryland public schools in academic year 2009-2010 (see Table 1). Of the 12th grade student population in 2009-2010, 59,000 went on to earn a high school diploma, 700 earned a certificate of completion, 1,000 persisted to a diploma, 1,000 persisted to a GED/certificate of completion, and 3,000 were considered non-completers. A total of 3,000 students between the ages of 16 and 21 earned a high school diploma via GED in academic year 2009-2010. Twelfth grade students and students who received a high school diploma via GED were combined to make up the base population for this report (total *N* = 68,000). The population of students who earned a high school diploma via GED contains individuals who have likely been engaged in the labor market (receiving wages) prior to obtaining the diploma via GED. When the base population of 12th grade students and students who received their diploma via GED during academic year 2009-2010 were examined, 72% were found to have enrolled in college (Maryland or out-of-state) at some point after the 2009-2010 academic year and only 28% were not found in college (the subject of this report).

Table 1. Total 12th Grade Students and Students Earning a High School Diploma via GED in 2009-2010 Academic Year

	2009-2010 Academic Year[a]	Some College after 2009-2010	No College Identified
12th Grade Students	65,000		
Diploma	59,000	79%	21%
Certificate of Completion	700	9%	91%
Persist to Diploma	1,000	36%	64%
Persist to GED/Certificate of Completion	1,000	15%	85%
Non-completers[b]	3,000	21%	79%
Diploma via GED (age 16-21)	3,000	38%	62%
Total Population	68,000	72%	28%

[a]The total numbers have been rounded to the nearest 100th or 1,000th and may not add to total.
[b]Non-completers included transfers, withdrawals, and all other outcomes including unknown.

Calculating Wages[5]

For the population of 12th grade students and diploma via GED earners in 2009-2010 who did not enroll in college, wage outcomes were calculated using three methods: (1) actual wages; (2) annualized wages; and (3) four-quarter wages. An example of calculating wages using each method is shown in Figure 1. There are four quarters in a calendar year in which an

[4] The total numbers have been rounded to the nearest large number value. As a result, numbers may not add to total.
[5] The MLDS does not contain workforce information for individuals working out-of-state, for the federal government, the military, self-employed individuals, or independent contractors.

individual can receive wages. Actual wages were calculated by summing the wages for all the quarters during a year. So, if an individual had wages for three of four quarters during a year that amount was summed to calculate an actual wage amount. This method retained all individuals who earned any wages during a year. Annualized wages were calculated by dividing the total amount of wages earned in the year by the number of quarters worked and multiplying by four. This method retained all individuals who earned any amount of wages during the year. Four-quarter wages were calculated by summing all four-quarters of wages for individuals who actually had some wages during all four quarters of the year. This method retained only individuals who had wages for all four quarters within the year. Individuals who had wages for 0-3 quarters were not included in the four-quarter wage population.

Each of the methods used in this report to calculate wages has strengths and weaknesses. Calculating wages using the actual wages method has the benefit of presenting information for all individuals who had wage information and only presents information as it existed in the data system. Calculating wages using the annualized wages method also has the benefit of presenting information for all individuals who had wage information. However, the annualized method replaced quarters with no reported wages with the average wage from the other quarters during the year. As a result, use of the actual wages method presented conservative or negatively biased wages and use of the annualized wages method presented wages that were less conservative and possibly overstated the wages earned. Calculating wages using the four quarter wage method has the advantage of reporting only actual reported wages but calculated wages for a subset of all workforce participants – only those who had wages in each of the four quarters during the year. For this report, 42% of wage earners had four-quarter wages, so the other 58% of the wage earners were not included in the median wage calculations using this method. Because only 42% of the wage earners had four-quarter wages, the total wages for this method over-stated wages for the population.

Figure 1. Methods for Calculating Wages for the Year

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Wages
Actual Wages[a]	$5,000		$2,000	$5,000	$12,000
Annualized Wages[b]	$5,000		$2,000	$5,000	$16,000
Four-Quarter Wages[c]	$5,000	$5,000	$2,000	$5,000	$17,000

[a] The sum of wages earned during the year ($5,000 + $2,000 + $5,000 = $12,000).
[b] The average per quarter wages (actual wages earned divided by the number of quarters worked, $12,000/3 quarters = $4,000) multiplied by four quarters ($4,000 x 4 = $16,000).
[c] The actual wages for the subset of people who had 4 quarters of wage information for the year.

Classifying Workforce Industry

Workforce industry was classified using the North American Industry Classification System (NAICS). The NAICS classification is the classification of the industry worked, but does not provide specific information about the job the individual was performing within the industry type. Industry information was provided for the top five most popular industries.

Findings

Seventy-two percent of 12th grade students and diploma via GED earners in 2009-2010 who did not enroll in college after the 2009-2010 academic year had wages identified in Maryland (see Table 2). Diploma earners who did not attend college had the highest percentage of students found in the wage data (79%) and those students who persisted to a high school diploma after the 2009-2010 academic year had a similar percentage of students found in the wage data (78%). A high percentage of non-completers (68%) and students who earned a diploma via GED (63%) were found in the wage data, but both groups of students were found in the wage data at lower rates than students who earned a diploma. Students who earned a certificate of completion (24%) or persisted to a GED/certificate of completion (37%) had the lowest percentage of students who were found in the wage data.

Table 2. Percent of Total 12th Grade Students and Students Earning a High School Diploma via GED in the 2009-2010 Academic Year with Wages Identified

	Total Number of Students 2009-2010 Who Did Not Attend College[a]	Wages Identified After 2009-2010	No Wages Identified
12th Grade Students			
Diploma	12,000	79%	21%
Certificate of Completion	600	24%	76%
Persist to Diploma	600	78%	22%
Persist to GED/Certificate of Completion	1,000	37%	63%
Non-completers[b]	700	68%	32%
Diploma via GED	2,000	63%	37%
Total Population	19,000	72%	28%

[a]The total numbers have been rounded to the nearest 100th or 1,000th and may not add to total.
[b]Non-completers included transfers, withdrawals, and all others including unknown.

Figures 2-5 display the percentages of 12th grade students and high school diploma via GED earners in the 2009-2010 academic year who did not attend college and were found in the wage data by gender (Figure 2), by race (Figure 3), by ethnicity (Figure 4), and by FARMs (Figure 5). Each figure is also displayed by high school achievement type. Students who earned a

certificate of completion or who persisted to either a high school diploma or a GED/certificate of completion were not included in the tables below due to small sample sizes upon disaggregation.

As can be seen in Figure 2 there were only small gender differences in the percentage of 12th grade students and diploma via GED earners who did not attend college who were found in the wage data for each achievement type examined. Overall, 72% of females and 73% of males were found in the wage data. Of the high school diploma earners, 78% of females and 80% of males were found in the wage data. Among diploma via GED earners, 66% of females and 64% of males were found in the wage data. Of the non-completers, 66% of females and 69% of males were found in the wage data.

Figure 2. Wage Outcomes of 12th Grade Students and Diploma via GED Earners (2009-2010) who did not Attend College by High School Achievement Type and Gender

Total

Achievement: Diploma

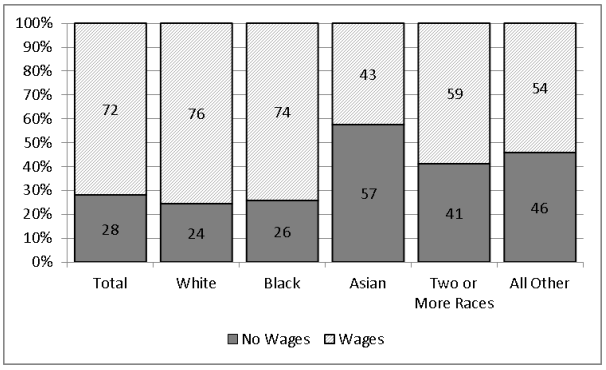
Achievement: Diploma via GED

Non-completers

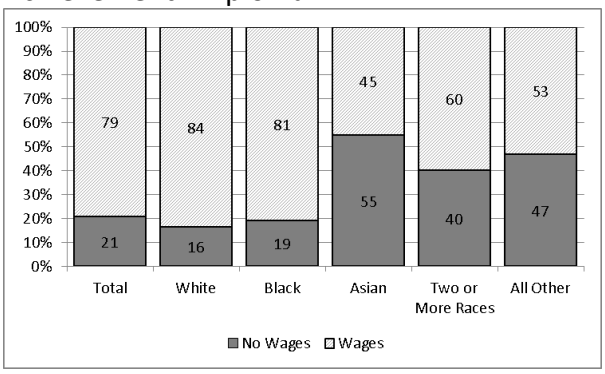
Overall for 12th grade students and diploma via GED earners who did not attend college, 76% of white students, 74% of Black students, 43% of Asian students, and 59% of students of two or more races were found in the wage data (see Figure 3). Among diploma earners 84% of white students, 81% of Black students, 45% of Asian students, and 60% of students of two or more races were found in the wage data. Among diploma via GED earners 67% of white students, 60% of Black students, 57% of Asian students, and 65% of students of two or more races were found in the wage data. Among high school non-completers, 69% of white students, 70% of Black students, 48% of Asian students, and 55% of students of two or more races were found in the wage data

Figure 3. Wage Outcomes for 12th Grade Students and Diploma via GED Earners (2009-2010) who did not Attend College by High School Achievement Type and Race

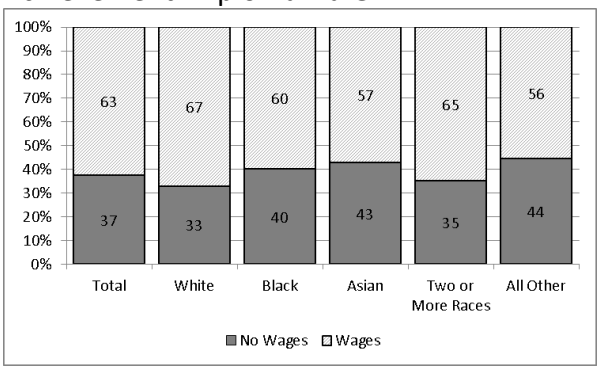
Total



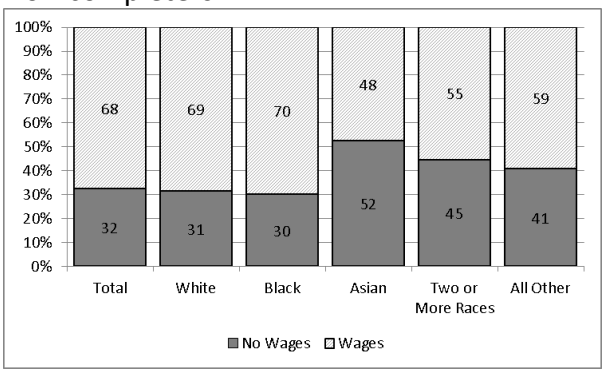
Achievement: Diploma



Achievement: Diploma via GED



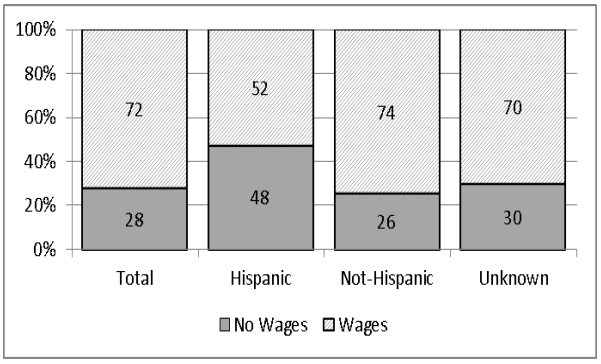
Non-completers



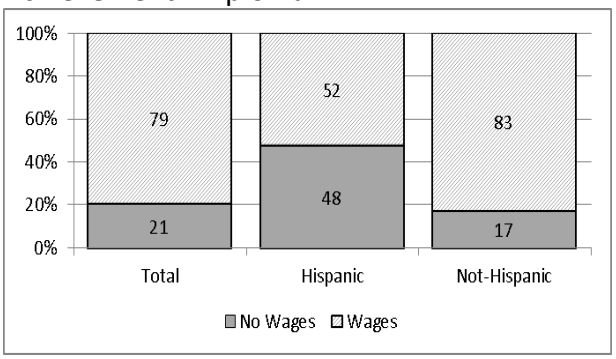
Overall, there was a large difference in the percentage of 12th grade students and diploma via GED earners who did not attend college and were found in the wage data by ethnicity. In the total population, 52% of Hispanic students and 74% of non-Hispanic students were found in the wage data (see Figure 4). The difference in wage participation was even more pronounced among the high school diploma earners: 52% of Hispanic students and 83% of non-Hispanic students were found in the wage data – a difference of 31 percentage points. Of the diploma via GED earners, 61% of Hispanic students and 54% of non-Hispanic students were found in the wage data. Among high school non-completers, 51% of Hispanic students and 70% of non-Hispanic students were found in the wage data.

Figure 4. Wage Outcomes for 12th Grade Students and Diploma via GED Earners (2009-2010) who did not Attend College by High School Achievement Type and Ethnicity

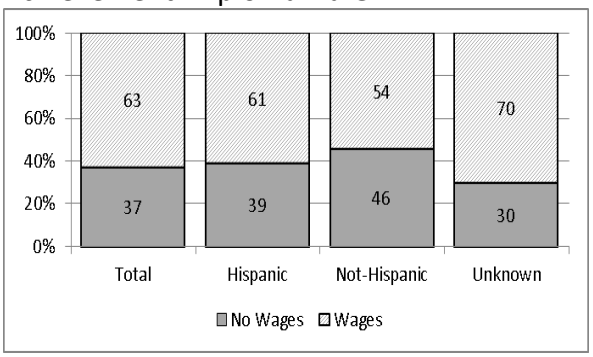
Total



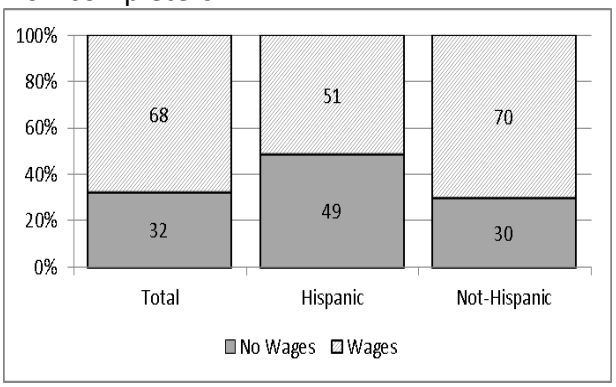
Achievement: Diploma



Achievement: Diploma via GED



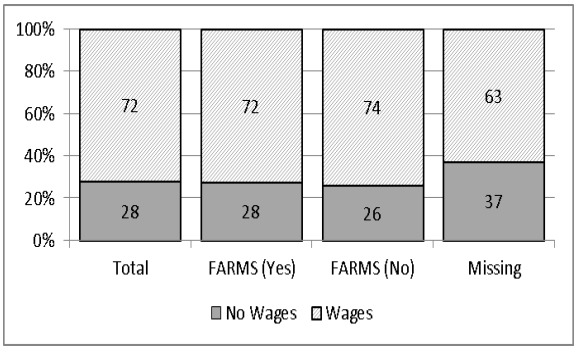
Non-completers



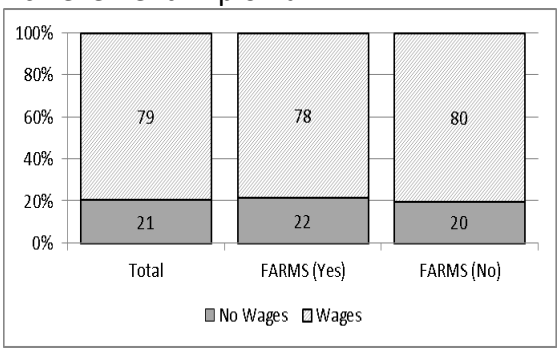
Overall, there is little difference between the percentages of 12th grade students and diploma via GED earners who did not attend college who were found in the wage data by eligibility for FARMs (see Figure 5). Overall, 72% of students eligible for FARMs and 74% of students not eligible for FARMs were found in the wage data. For students who earned a high school diploma, 78% of students eligible for FARMs and 80% of students not eligible for FARMs were found in the wage data. The data used to identify diploma via GED earners did not contain information on eligibility for FARMs. Therefore, that population is omitted from Figure 5. For high school non-completers, 59% of students eligible for FARMs and 52% of students not eligible for FARMs were found in the wage data.

Figure 5. Wage Outcomes for 12th Grade Students (2009-2010) who did not Attend College by High School Achievement Type and FARMs

Total



Achievement: Diploma



Non-completers

Note. FARMs = Student eligibility for free and reduced price meals. The data used for the diploma via GED earners did not contain information on eligibility for FARMs, therefore they are not included in this figure.

Wage information for individuals who were 12th grade students or high school diploma via GED earners in the 2009-2010 academic year and did not go on to college can be seen in Figure 6 below. Using the median four-quarter wage method, individuals who had earned a diploma via GED had median wages that were consistently higher than all other achievement types. This may be because these individuals had more direct work experience and a longer history in the workforce (some of the diploma via GED earners were in the workforce prior to earning their diploma via GED). Individuals who received their high school diploma earned the

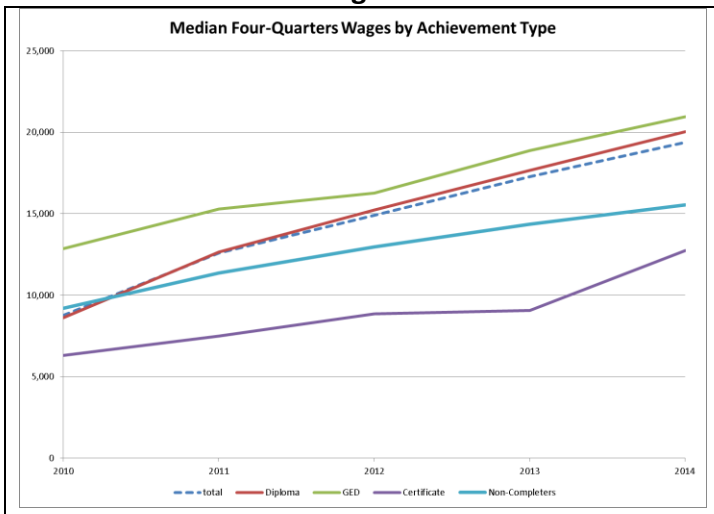
next highest wages and narrowed the gap between themselves and the high school diploma via GED earners between 2010 and 2014 (five years out from the 12th grade/diploma via GED completion year. Non-completers had the next highest median four-quarter wages with total median wages of $15,500 five years after the 12th grade. Finally, individuals who earned a certificate of completion had the lowest median four-quarter wages with total median wages of $12,750 five years after the 12th grade.

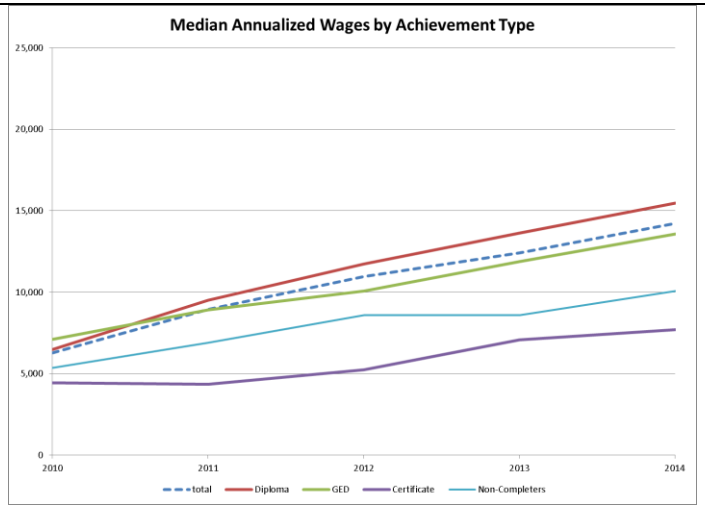
The annualized median wages for 12th grade students and diploma via GED earners who did not go on to college were consistently lower than the four-quarter wages for each achievement type examined. In 2014, high school diploma earners had median annualized wages of approximately $15,500, whereas high school diploma via GED earners had median annualized wages of approximately $13,600. Non-completers had the next highest annualized median wages with total median wages of $10,000 five years after the 12th grade. Finally, individuals who earned a certificate of completion had annualized median wages of approximately $7,700 five years after the 12th grade.

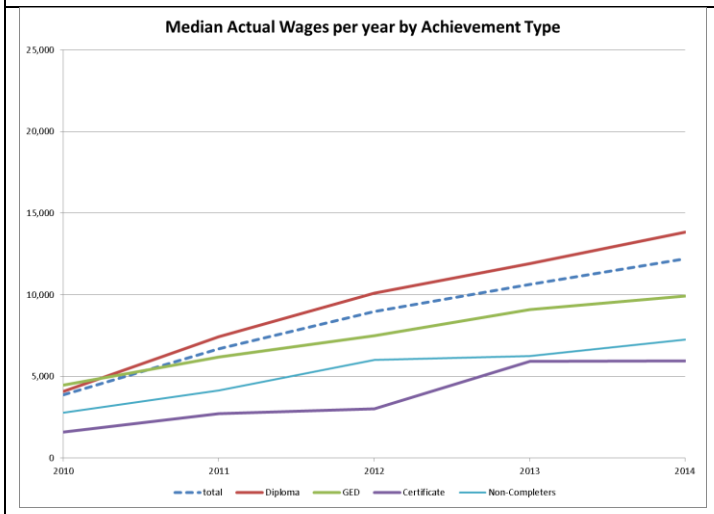
The actual median wages for 12th grade students and diploma via GED earners in 2009-2010 who did not attend college were consistently lower than both the four-quarter wages and the annualized wages. The actual median wages for high school diploma earners five years post-graduation was $13,800, followed by high school diploma via GED earners with actual median wages five years post diploma via GED of $9,900. Non-completers have the next highest actual median wages with total median wages of $7,270 five years after the 12th grade. Finally, individuals who earned a certificate of completion earned an actual median wage of less than $6,000 five years after the 12th grade.

Overall, the four-quarter median wages were $5,000 higher than the annualized wages five years after the 12th grade/diploma via GED earning year and $7,000 higher than the actual wages five years after the 12th grade/diploma via GED earning year. The largest differences can be seen in individuals who earned their diploma via GED. For diploma via GED earners, the four-quarter median wages were almost $7,500 higher than the annualized wages and $11,000 higher than the actual wages five years after the 12th grade. For the remainder of the report, we display the four-quarter median wages in comparison to the actual wages earned by high school achievement type for students who did not attend college.

Figure 6. Wages Over Time by High School Achievement Type for 12th Grade Students and Diploma via GED Earners (2009-2010) who did not Attend College







Median Wages Five Years Post 12th Grade - 2009-2010 Academic Year – by Achievement Type and Wage Calculation Method

Achievement Type	Actual Wages	Annualized Wages	Four-Quarter Wages
Total	$12,199	$14,234	$19,400
Diploma	$13,849	$15,484	$20,041
GED	$9,928	$13,571	$20,970
Certificate of Completion	$5,965	$7,707	$12,748
Non-Completers	$7,271	$10,079	$15,538

Figure 7 displays the median four-quarter wages and the actual wages earned by the top five most popular industries for all achievement levels combined for the population of 12th grade students and diploma via GED earners who did not attend college. Overall, as expected, median four-quarter wages were higher in comparison to median actual wages. The industries with the highest wages when examining the four-quarter wages were health care and social assistance; other services; and administrative support and waste management and remediation services. Median actual wages earned in health care and social assistance and in other services were higher than the total median actual wages for all industries combined (represented by the dotted line).

Figure 7. Median Four-Quarter Wages and Actual Wages by Top 5 Industries for 12th Grade Students and Diploma via GED Earners (2009-2010) who did not Attend College All Achievement Types Combined

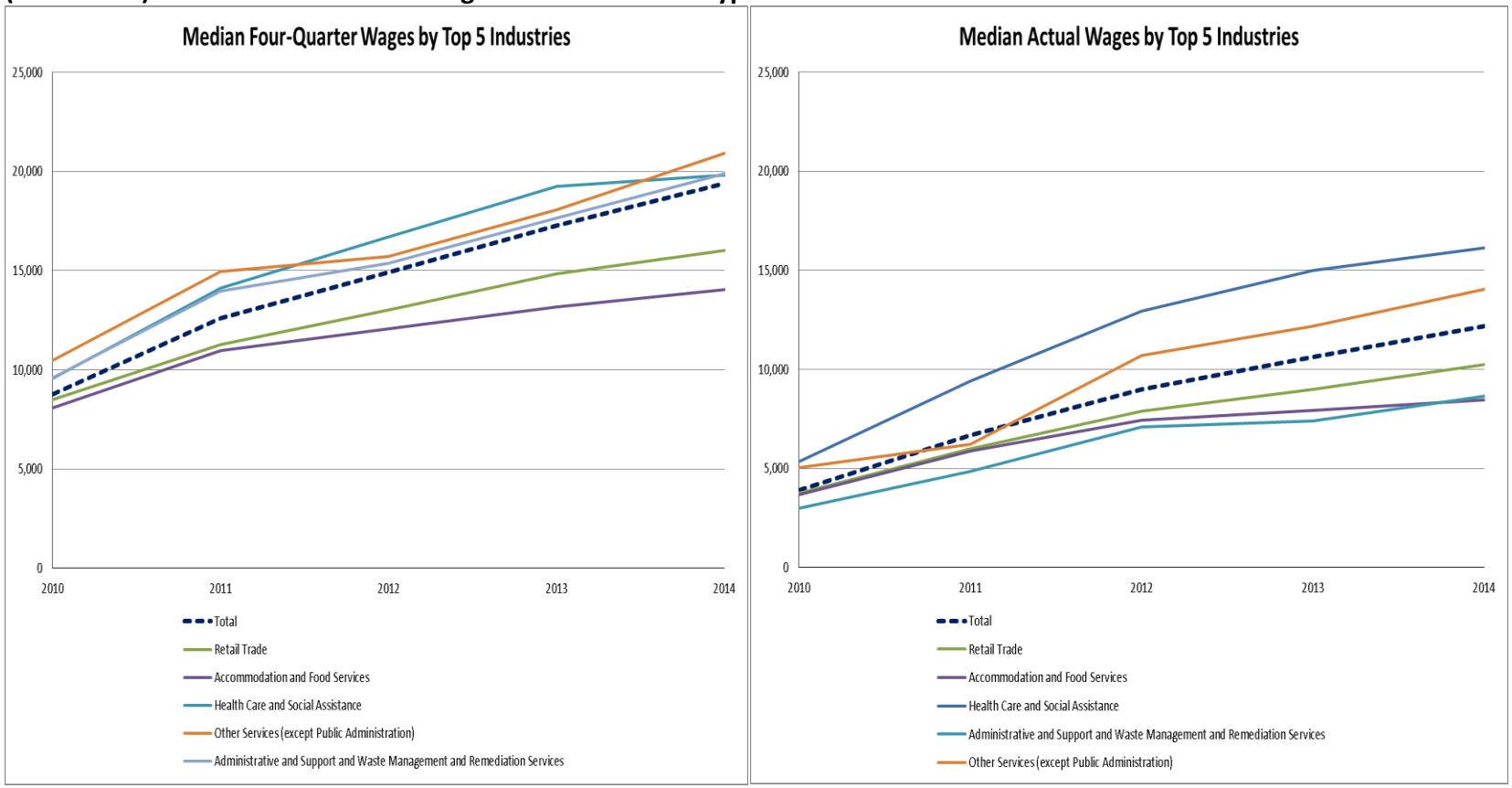


Figure 8 displays the median four-quarter wages and the median actual wages earned by the top five most popular industries for students who earned a high school diploma and did not attend college. For high school diploma earners who did not attend college, the industries with the highest wages were health care and social assistance; other services; and administrative and support and waste management and remediation services. For the median actual wages, only the health care and social assistance and other services industries had median wages above the total median wages (represented by the dotted line).

Figure 8. Median Four-Quarter Wages and Actual Wages by Top 5 Industries for 12th Grade Students (2009-2010) who Earned a Diploma and did not Attend College

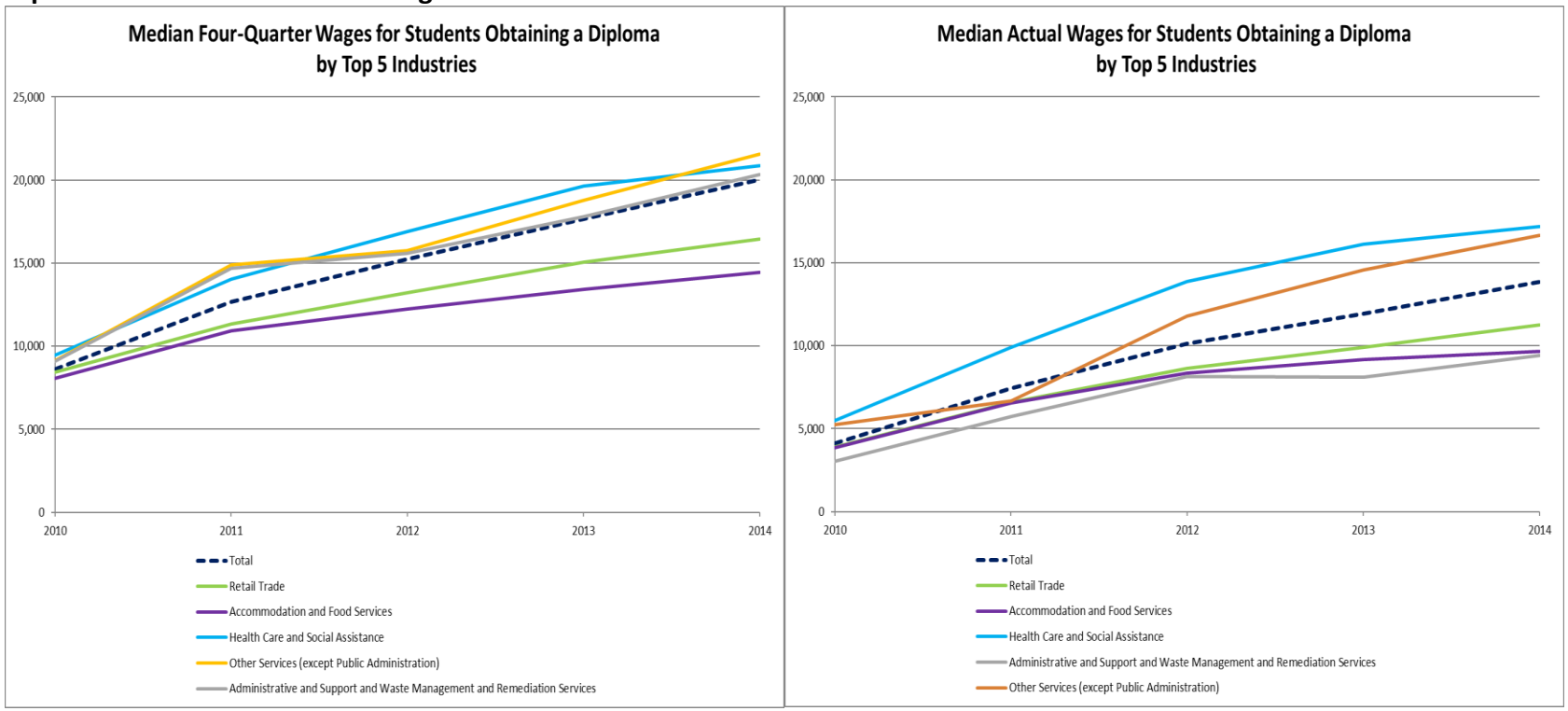
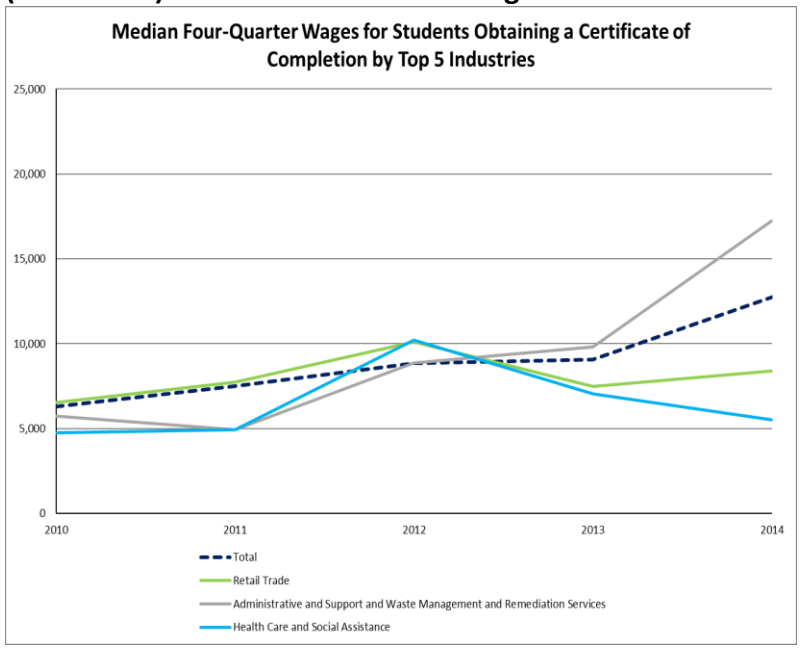
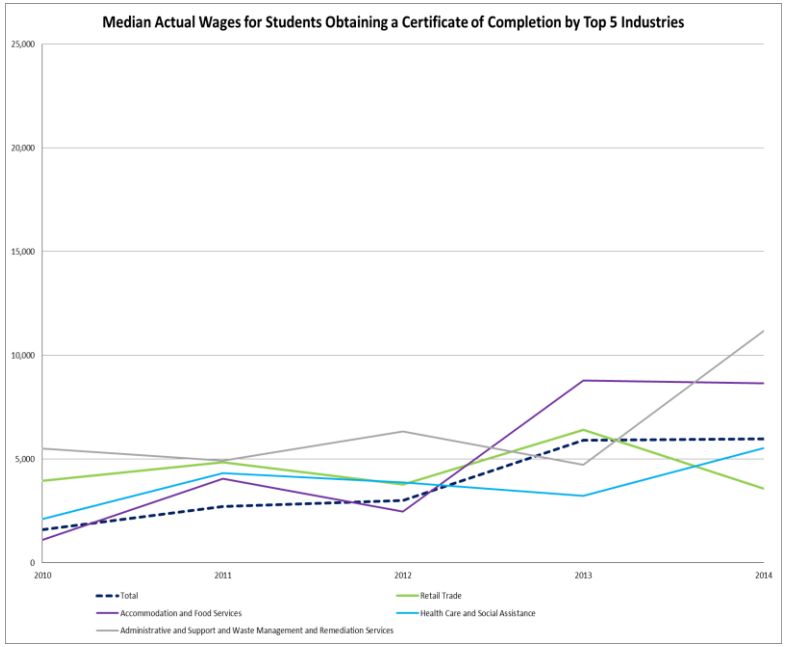


Figure 9 displays the median four-quarter wages and the median actual wages earned by the most popular industries for students who earned a certificate of completion and did not attend college. Three industries are displayed for the four-quarter wages method and four industries are displayed for the actual wages method. This was to ensure that the overall number of individuals per industry were sufficiently large upon disaggregation. The four-quarter wages had variability in the overall wage trajectories with administrative and support and waste management and remediation services being the only industry with wages higher than the total median wages (represented by the dotted line) after 5 years. Using the actual wage method, retail trade and health services each had an unusual increase of actual wages over the total median wages in 2012 but then normalized to below the total median wages (represented by the dotted line). The median actual wages for accommodation and food services and administrative and support and waste management were higher than the total median wages after 5 years.

Figure 9. Median Four-Quarter Wages and Actual Wages by Top 5 Industries for Students Earning a Certificate of Completion (2009-2010) who did not Attend College





Note. To ensure sufficient cell sizes upon disaggregation by industry, fewer than 5 industries are displayed.

Figure 10 displays the median four quarter wages and the median actual wages earned by the top five most popular industries for students who earned a diploma via GED who did not attend college. The four-quarter wages in construction, health care and social assistance, and administrative and support and waste management and remediation services were higher than the total median wage (represented by the dotted line). Using the actual wages method, the construction and other services industries consistently had wages higher than the total median wage (represented by the dotted line). The diploma via GED high school achievement type was the only achievement type for which the construction industry was included in the top 5 industries.

Figure 10. Median Four-Quarter Wages and Actual Wages by Top 5 Industries for Students Who Earned a Diploma via GED (2009-2010) and did not Attend College

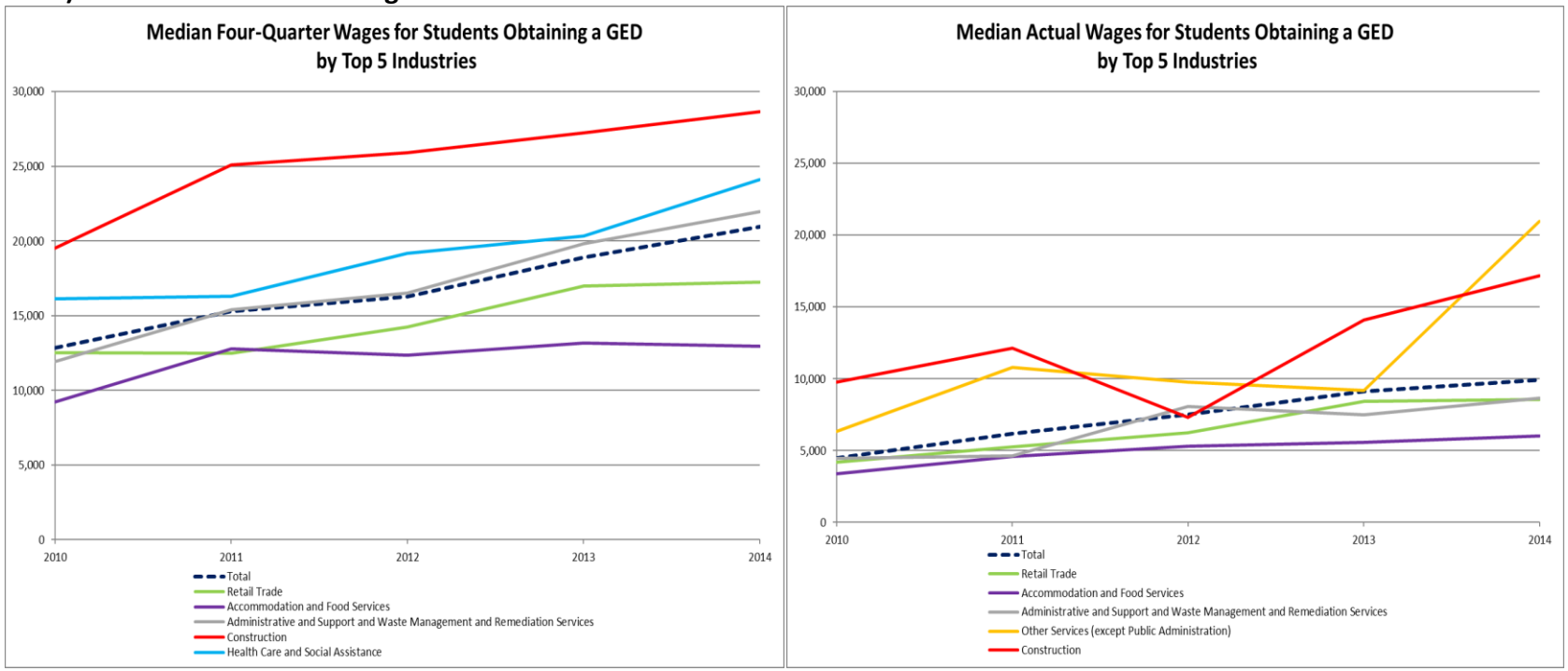
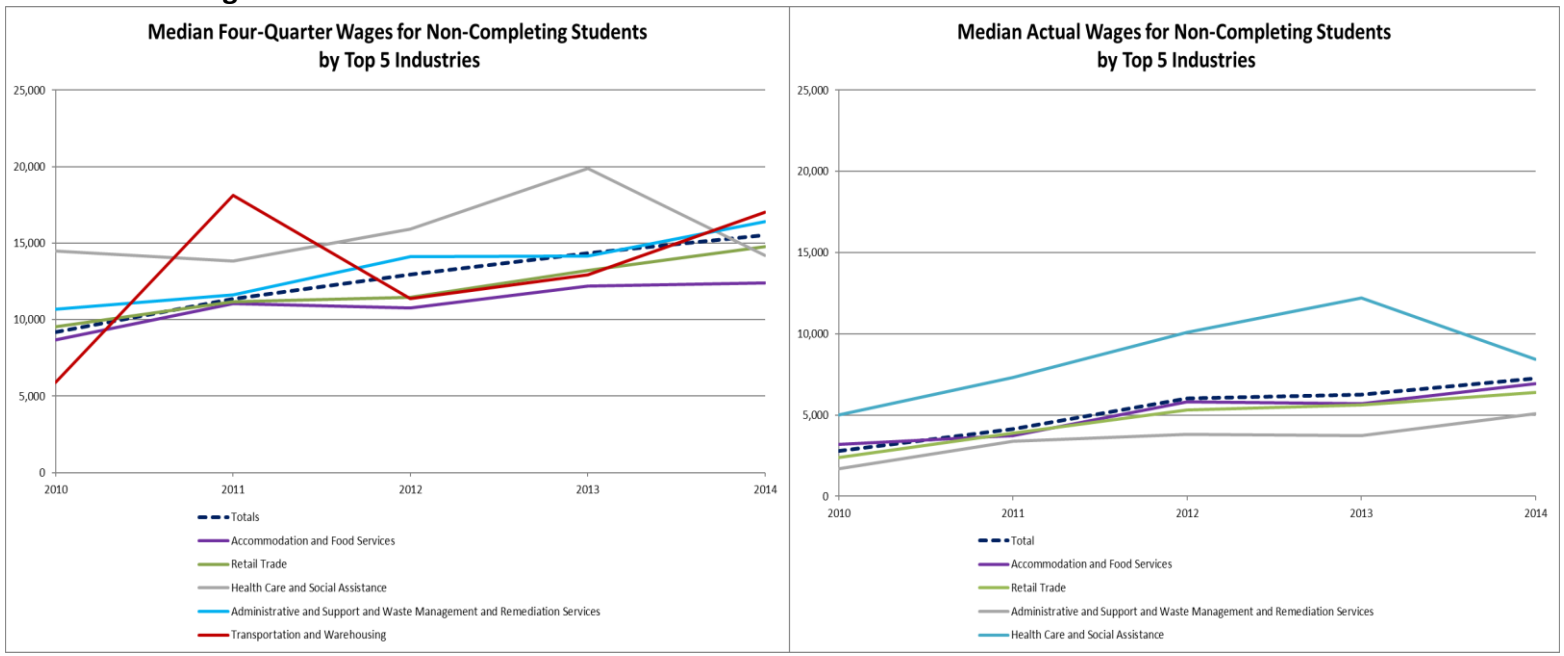


Figure 11 displays the median four-quarter wages and the median actual wages earned by the top five most popular industries for high school non-completing students who did not attend college. High school non-completers who did not attend college who worked in the health care and social assistance and the administrative support and waste management and remediation services industries had median four-quarter wages that were above the total median wages (represented by the dotted line). Using the actual wages method, individuals who worked in the health care and social assistance industry were the only group with median wages greater than the overall total median wages (represented by the dotted line).

Figure 11. Median Four-Quarter Wages and Actual Wages by Top 5 Industries for Non-Completing Students (2009-2010) who did not Attend College



Summary of Findings

This report used three methods to calculate wages for students who were in 12th grade or earned a diploma via GED during the 2009-2010 academic year and did not attend college. Calculating wages using the four-quarter method yielded the highest earnings, whereas calculating wages using the actual wages method yielded the lowest earnings. High school diploma earners who did not attend college earned the highest wages in the health care and social assistance and the other services (except public administration) industries. High school certificate of completion earners who did not attend college earned the highest wages in the administrative and support and waste management and remediation services industry. High school diploma via GED earners who did not attend college earned the highest wages in the construction, other services (except public administration), and health care and social assistance industries. High school non-completers earned the highest wages in the transportation and warehousing and health care and social assistance industries.

Discussion

Consistent with prior national research (Ewert, 2012; Kena et al., 2016), this report confirmed that Maryland high school diploma earners, certificate of completion earners, high school diploma via GED earners, and high school non-completers who did not attend college have varied workforce outcomes. Maryland students with a high school diploma earned the highest overall actual median wages five years after their 12th grade year, followed by diploma via GED earners, then high school non-completers, and students who earned a certificate of completion. This ordering is consistent with national data from the U.S. Census Bureau and the NCES (Ewert, 2012; Kena et al., 2016). When using the four-quarter wage method to calculate wages by achievement type in Maryland, the diploma via GED earners actually earned slightly higher wages than students who had earned a high school diploma. This may be because we examined wages for diploma via GED earners between the ages of 16 and 21, which means that these individuals may have been engaged in the workforce prior to earning their diploma via GED.

The results of this study are descriptive and should not be used to conclude a causal relationship between high school achievement type and workforce outcomes. A number of variables, including student demographic characteristics, student achievement scores, and high school characteristics might help to explain why students have different workforce outcomes by high school achievement level. Additionally, prior research has indicated that behavioral and health variables were associated with student outcomes (Maynard et al., 2014; Muennig, 2000). The MLDS does not contain information on students' behavioral and health information, and thus, this is a gap in the analysis of this study.

In sum, this report focused on the workforce outcomes of high school 12th grade students and diploma via GED earners who did not attend college. In general, students who graduate high school with a regular high school diploma attend college at higher rates than

students who do not earn a regular high school diploma (see Appendix). Thus, the population for this report (students who did not attend college) under-represents the workforce outcomes of the total population of students who graduate with a regular high school diploma. This should be kept in mind when interpreting results. Future studies will examine the workforce outcomes of students who attend college (see Klein, Zheng, Sunderman, Henneberger, Stapleton, & Woolley [2016] for an example using the MLDS to examine the workforce outcomes of students who attend college and work in the early childhood care and education industry and Zheng, Stapleton, Henneberger, & Woolley [2016] for an example using the MLDS to examine the workforce outcomes of students who major in science, technology, engineering, and math [STEM] in college).

Our findings point to the potential importance of encouraging students to complete high school, preferably through graduation with a regular high school diploma. When that is not possible encouraging students to complete high school through a diploma via GED program may lead to better workforce outcomes than high school non-completion. Doing so may help to prevent long-term costs associated with high school non-completion, including health, welfare, and crime costs (Belfield et al., 2012; Levin, 2005; Maynard et al., 2014; Moretti, 2005; Rumberger & Lamb, 2003).

Policy Implications

It is important to provide administrators with policies aimed at increasing the rates of high school graduation with a regular high school diploma. Of the students examined as part of the 2009-2010 cohort, 79% of regular high school diploma earners were found in the wage data, compared to 63% of high school diploma via GED earners, 68% of non-completers, and only 24% of certificate of completion earners. A higher percentage of students who persisted to a high school diploma were found in the wage data (78%) when compared to high school diploma via GED earners, high school non-completers, and students who earned a certificate of completion. This information highlights the potential importance of policies that encourage students to graduate with a regular high school diploma, as this credential is correlated with higher likelihood of being found in the wage data and increased earnings.

For students who did not earn a regular high school diploma, workforce participation and wage earnings were higher for diploma via GED earners when compared to high school non-completers. For example, the median actual wages for high school diploma via GED earners was $2,700 greater than for high school non-completers ($9,900 compared to $7,300). This difference was even more pronounced when four-quarter wages were examined. The median four-quarter wages for high school diploma via GED earners was $5,400 greater than for high school non-completers ($21,000 compared to $15,500). This information highlights the potential importance of policies that encourage students who did not graduate with a regular high school diploma to enroll in diploma via GED programs, as this credential relates to higher likelihood of being found in the wage data and increased earnings when compared to high school non-completers.

The wages earned by students varied by the industry worked. The industry with the highest wages earned for students who did not go on to college (using both actual wages and four-quarter wages) was in health care and social assistance. The retail and accommodation and food services industries were consistently below the overall median wages across all achievement types. For students who do not plan to attend college, it may be beneficial for high schools to offer targeted workforce training programs so they have the skills necessary to begin employment in the specific industries with higher median wages (i.e., health care and social assistance).

Future Research

A number of future directions for research using data from the MLDS are noteworthy. First, additional years of longitudinal data will allow a better understanding of the long-term associations between high school achievement and wage earnings. In this study, the overall median wages for the population of diploma via GED earners were slightly higher than the median wages for students who earned their high school diploma. There was a distinct trend such that the gap between the median wages of high school diploma earners and diploma via GED earners narrowed over time. By examining additional years of longitudinal data, we might see the gap disappear or reverse such that the wages of high school diploma earners become higher than diploma via GED earners. Second, this report focused on students who did not go to college. Future research will examine the workforce outcomes of students who did not go to college in comparison to students who did enroll in a college and/or earn a college degree.

Finally, future research will use advanced statistical methods to examine whether there are different wage trajectories within high school achievement groups based on student, high school, and school district characteristics. For example, do some high school non-completers experience better workforce outcomes than others? If so, what are the characteristics of the high school non-completers who do experience better workforce outcomes? For students who earn a high school diploma or a diploma via GED, what characteristics are associated with earning higher wages? Are there specific high school course taking trajectories that are associated with higher wages for high school diploma earners? This research would provide information on the specific subgroups of students within each high school achievement level that could be targeted for prevention and intervention services.

Conclusion

This report examined the workforce outcomes of a cohort of 12th grade students and diploma via GED earners (2009-2010) who did not attend college by high school achievement type. In general, high school diploma earners who did not go on to college were the most engaged in the workforce, followed closely by students who persisted to a high school diploma. Both high school diploma earners and high school diploma via GED earners had wages that were consistently higher than high school non-completers and certificate of completion earners five years after the 12th grade/diploma via GED year. The findings of this report highlight the

potential importance of encouraging students to complete high school with a regular high school diploma or GED. Additionally, targeted workforce training programs offered in high school that discuss wage earnings and offer avenues in which to gain employment in the workforce industries that pay the highest wages may benefit students who do not attend college.

References

Belfield, C. R., Levin, H. M., & Rosen, R. (2012). The Economic Value of Opportunity Youth. *Corporation for National and Community Service*. Paper in association with Civic Enterprises for the Corporation for National and Community Service. Retrieved from http://www.civicenterprises.net/MediaLibrary/Docs/econ_value_opportunity_youth.pdf

Ewert, S. (n.d.). GED Recipients Have Lower Earnings, Are Less Likely to Enter College. *US Census Bureau*. Retrieved from http://blogs.census.gov/2012/02/27/ged-recipients-have-lower-earnings-are-less-likely-to-enter-college/

Kena, G., Hussar W., McFarland J., de Brey C., Musu-Gillette, L., Wang, X., Zhang, J., Rathbun, A…Velez, E. (2016). The Condition of Education 2016 (NCES 2016-144). *U.S. Department of Education, National Center for Education Statistics*. Washington, DC. Retrieved from http://nces.ed.gov/pubsearch

Kim, K. N. (2013). Career trajectory in high school dropouts. *The Social Science Journal*, *50*(3), 306-312.

Klein, E.L., Zheng, X., Sunderman, G.L., Henneberger, A.K., Stapleton, L.M. & Woolley, M.E. (2016). *Preparation and Retention of the Early Childhood Care and Education Workforce in Maryland*. Baltimore, MD: Maryland Longitudinal Data System Center.

Levin, H. (2005). The social costs of inadequate education. *Columbia University Teachers College.* Retrieved from www.tc.columbia.edu/i/a/3082_SocialCostsofInadequetEducation.pdf

Levin, H. M., Belfield, C., Muennig, P., & Rouse, C. (2007). The public returns to public educational investments in African-American males. *Economics of Education review*, *26*(6), 699-708.

Maynard, B. R., Salas-Wright, C. P., & Vaughn, M. G. (2015). High school dropouts in emerging adulthood: substance use, mental health problems, and crime. *Community Mental Health Journal*, *51*(3), 289-299.

McFarland, J., Stark, P., and Cui, J. (2016). Trends in High School Dropout and Completion Rates in the United States: 2013 (NCES 2016-117). *U.S. Department of Education*. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubsearch

Moretti, E. (2005). Does Education Reduce Participation in Criminal Activities. Paper prepared for the Symposium on The Social Costs of Inadequate Education Teachers College, Columbia University. Retrieved from http://devweb.tc.columbia.edu/manager/symposium/Files/74_Moretti_Symp.pdf

Muennig, P. (2000). Health Returns to Education Interventions. Paper prepared for the Symposium on The Social Costs of Inadequate Education Teachers College, Columba University. Retrieved from http://devweb.tc.columbia.edu/manager/symposium/Files/81_Muennig_paper.ed.pdf

Rumberger, R. W., & Lamb, S. P. (2003). The early employment and further education experiences of high school dropouts: A comparative study of the United States and Australia. *Economics of Education Review*, *22*(4), 353-366.

Uretsky, M.C., Henneberger, A.K., & Woolley, M.E. (2016). *High School Persisters: An Examination of College and Workforce Outcomes*. Baltimore, MD: Maryland Longitudinal Data System Center.

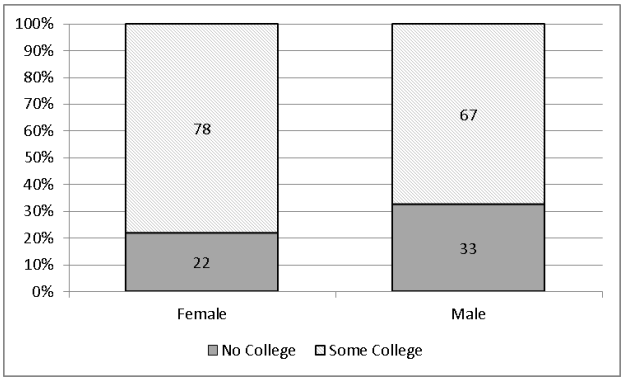
Zajacova, A. (2012). Health in working-aged Americans: Adults with high school equivalency diploma are similar to dropouts, not high school graduates. *American Journal of Public Health*, *102*(S2), S284-S290.

Zheng, X., Stapleton, L. M., Henneberger, A. K., & Woolley, M. E. (2016). *Assessing the Workforce Outcomes of Maryland Science, Technology, Engineering, and Math (STEM) Postsecondary Graduates*. Baltimore, MD: Maryland Longitudinal Data System Center.

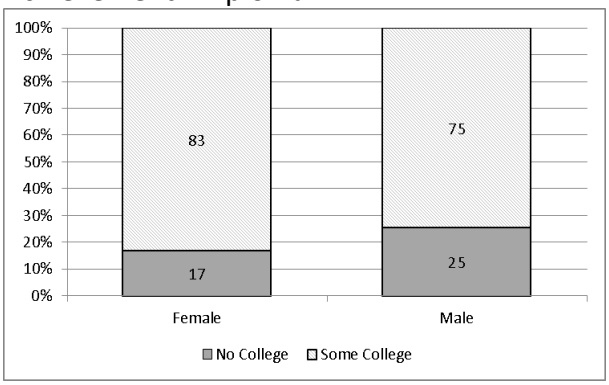
Appendix

Figure A.1. College Outcomes for 12th Grade Students and Diploma via GED Earners (2009-2010) by High School Achievement and Gender

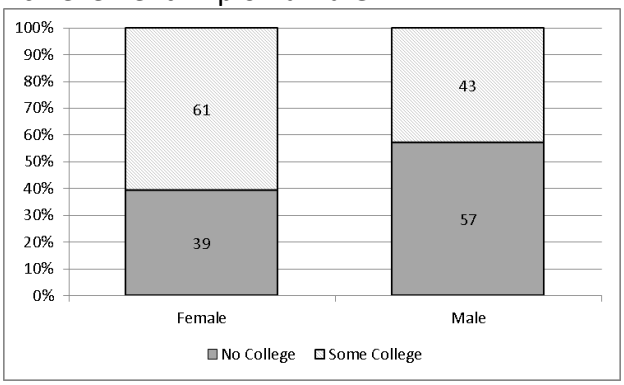
Total



Achievement: Diploma



Achievement: Diploma via GED



Non-completers

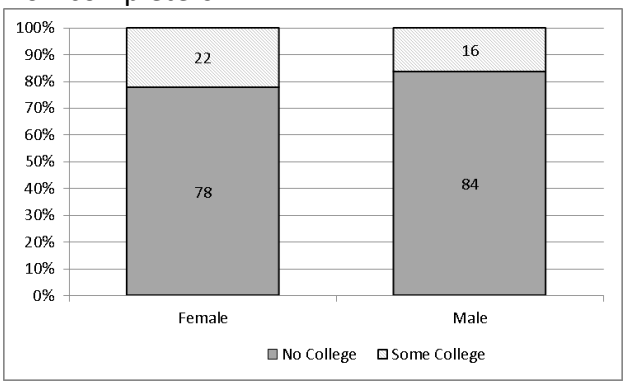
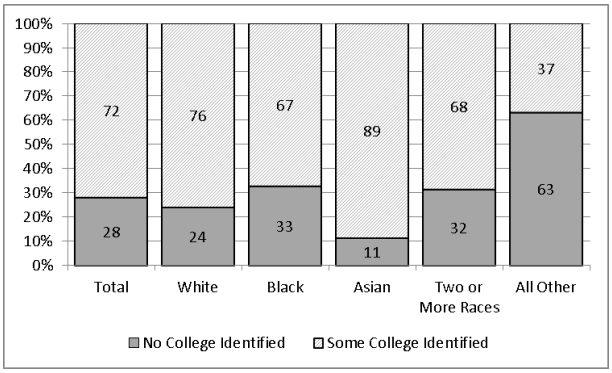
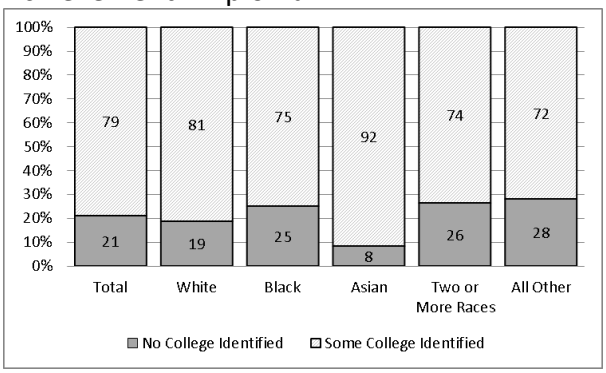


Figure A.2 College Outcomes for 12th Grade Students and Diploma via GED Earners (2009-2010) by High School Achievement and Race

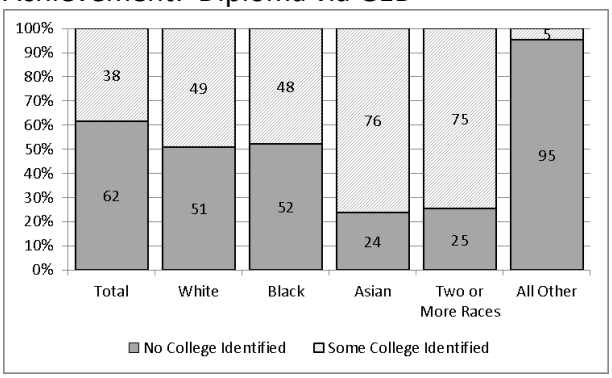
Total



Achievement: Diploma



Achievement: Diploma via GED



Non-Completers

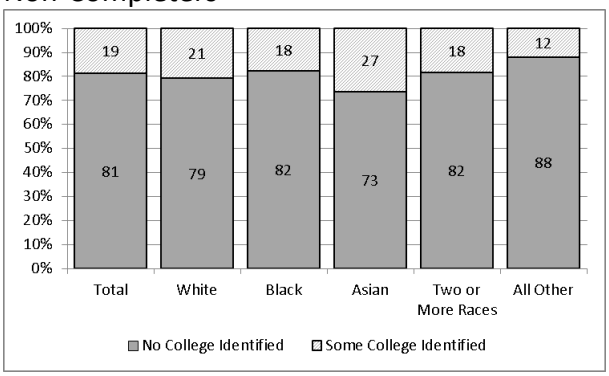
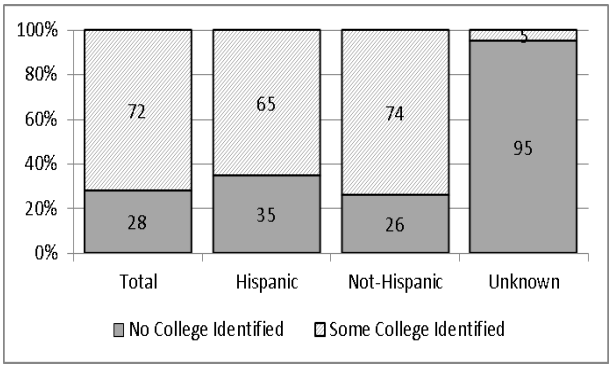
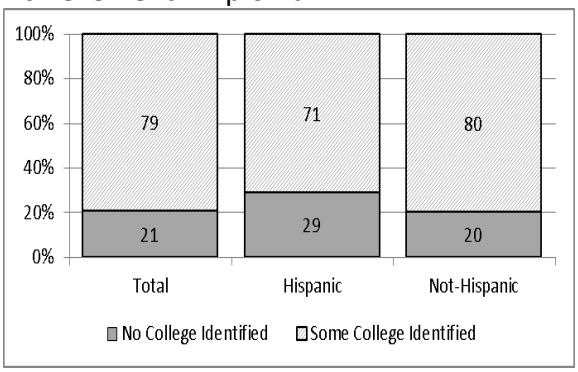


Figure A.3 College Outcomes for 12th Grade Students and Diploma via GED Earners (2009-2010) by High School Achievement and Ethnicity

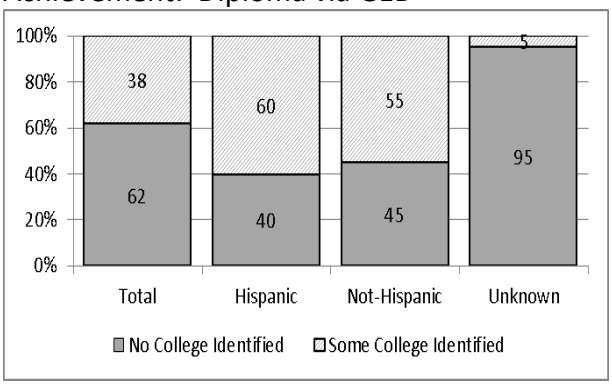
Total



Achievement: Diploma



Achievement: Diploma via GED



Non-Completers

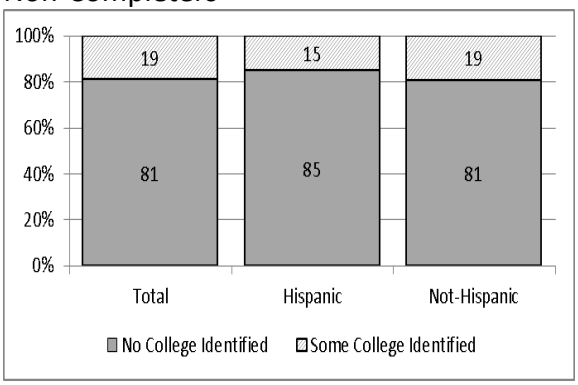
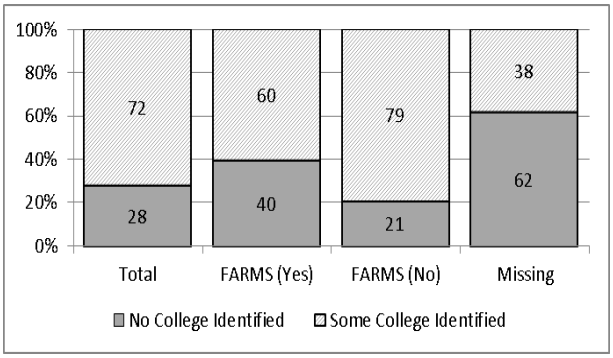
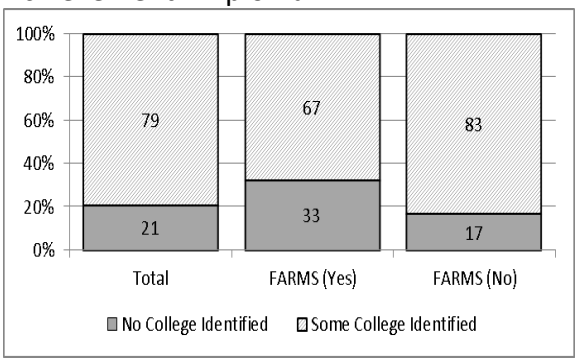


Figure A.4 College Outcomes for 12th Grade Students (2009-2010) by High School Achievement and FARMs

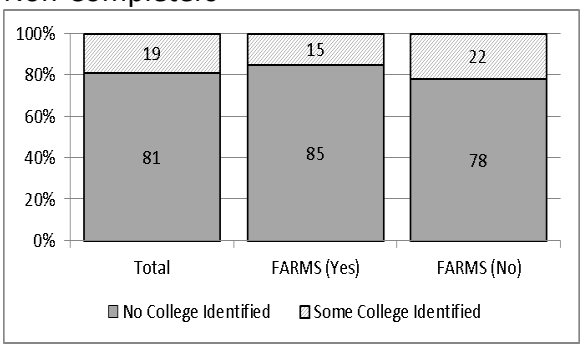
Total



Achievement: Diploma



Non-Completers



Note. FARMs = Student eligibility for free and reduced price meals. The data used for the diploma via GED earners did not contain information on eligibility for FARMs, therefore they are not included in this figure.