COLORADO
Department of Higher Education

2021 Higher Education Return on Investment Report

2021

The Colorado Department of Higher Education

Annual Return on Investment Report

Statute: C.R.S. 23-1-135

COLORADO
Department of
Higher Education

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COLORADO
Department of Higher Education

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Jared Polis
Governor

Dr. Angie Paccione
Executive Director

Numerous studies consistently demonstrate the economic, psychological, and social benefits of earning a college degree. People who continue their education beyond high school earn more money, feel healthier, and engage more deeply with their communities. They are less likely to live in poverty, smoke, and be incarcerated. Their children are more likely to succeed in school and reap the benefits their parents enjoy.

However, the value of a college degree has been called into question as COVID-19 left deep scars in higher education and society at large. The pandemic forced colleges to change their mode of delivery from face-to-face to virtual thereby accelerating tuition increases. Coupled with this development, rising unemployment, and falling median income, many asked, 'Is a college degree worth my time, money, and energy?'

This report answers, 'Yes, it is!' by demonstrating that the value of a college degree remains consistent regardless of times of economic prosperity or recession. In fact, this value becomes more apparent during periods of economic uncertainty. Additionally, this report aims to help Coloradans maximize their college investment by providing a detailed analysis of cost and wage data.

Despite tuition increases, prospective students have more say in containing costs than they think—they can choose whether to take advantage of concurrent enrollment programs, whether to live at home or on-campus, which school to attend and which scholarships to apply for, what programs to major in, how long to graduate, and most importantly, whether to graduate. These decisions before and throughout a higher education journey can significantly affect a student's return on investment.

Furthermore, even in times when the unemployment rate increased and median income decreased, prospective students can still maximize their return by understanding historic data on college programs and wage outcomes and leveraging them with their area of interest.

The recommendations in this report will not only help us achieve the goals included in the *Roadmap to Containing College Costs and Making College Affordable* but also help us reach 66% educational attainment as a state by 2025. We need legislators and business and education leaders to collaborate on creating a Colorado that works for everyone and prioritizes making college affordable. Armed with this robust data, we hope that individuals—and our state—can make pursuing a college degree affordable while making the most of higher education investment.

Sincerely,

Jared Polis
Governor

Dr. Angie Paccione
Executive Director of the Colorado Department of Higher Education

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Introduction

Coloradans Need Higher Education in Times of Economic Prosperity and Recession

Along with the nation and world, Colorado's economy has been impacted by the COVID-19 pandemic. Since Colorado's first official case of COVID-19 in March 2020, the unemployment rate shifted from a historic low of 2.5% to a historic high of 12.2% in merely a month[1]. Colorado's gross domestic product (GDP) plummeted from $400 billion to $365 billion[2], marking the largest drop in two consecutive quarters in 11 years. During this period, 342,000 nonfarm jobs were lost[3] and 19,000 businesses closed.

Despite this shock from the pandemic, Colorado's economy has rebounded quickly. Since its peak, the unemployment rate decreased to 8.4% in December 2020, while the 3rd quarter GDP increased to $394 billion. There were 194,100 nonfarm jobs recovered[4], and 51,000 new businesses opened in the first two quarters of 2020[4]. Along with this pace of recovery, the sequential administration of COVID-19 vaccines and the popular sentiment that this pandemic is a once-in-100-years event is instilling hope that pre-pandemic normalcy is just around the corner.

A pandemic of this scale is indeed an extremely rare event; the last recorded pandemic of a similar relative scale was the Spanish flu in 1918[5]. However, a recession is a recurrent event that the U.S. has faced 11 times since the 1950s[6]. This history suggests that future recessions are likely and marks the importance of preparing Coloradans for economic uncertainty. One effective way to do this is by earning a college degree. A longitudinal study by the National Center for Education Statistics identified that graduates with college degrees earned on average $4 more in hourly wages than those with terminal high school degrees[7]. Furthermore, graduates with college degrees had higher unemployment rates and were more likely to work full-time than those with terminal high school degrees. Consistent with these findings, this report highlights the role of higher education credentials in helping Coloradans successfully weather a recession, and underscores that higher education helps individuals to establish financial stability during periods of prosperity.

A college education provides personal and intellectual growth and serves to empower individuals through transferring advanced knowledge.[8] Individuals make education and career choices for a variety of personal and societal benefits. This report provides Coloradans with information on investment and financial return and on making data-informed decisions along their higher education journey. Lastly, this report provides a message of hope that Colorado is progressing toward establishing a more equitable workplace where one's gender and ethnicity are becoming less relevant in projecting one's financial return from investing in higher education.

Trends in Enrollment and Credential Completion

Colorado Will Continue to Increase Enrollment and Credential Completion

In 2012, Colorado instituted an ambitious goal that 66% of Coloradans earn postsecondary credentials by 2025. Each year, Colorado makes meaningful strides towards realizing this goal. Since 2007, Coloradans have increasingly enrolled in and earned credentials from Colorado public higher education institutions. In academic year 2007, 137,590 enrollees reached 182,249 in 2020 (an increase of 32%). Also, during this period, the number of credentials completed increased by 81% (from 27,972 to 50,657). Based on these past trends, it is projected that by 2021, the number of enrollees and the number of completers would surpass 185,000 enrollees and 52,000 credentials completed.

Considering the pandemic impact, these projected numbers may sound optimistic. The unemployment rate and the consequent restraint in financial resources could discourage Coloradans from entering and completing higher education pathways. This next section looks at trends in these measures during the Great Recession.

Between December 2007 and June 2010, Colorado's unemployment rate more than doubled from 4.1% to 8.9%[2], while its GDP decreased from $253 billion to $245 billion. In proportion to this trend in the GDP, the total personal income also decreased from $204 billion to $198 billion during the same period[3]. From these outcomes, it is reasonable to assume that Coloradans had more limited financial resources to invest in higher education and thus would forego benefiting from this service sector. However, the data reveal a counterintuitive story: over the past 13 years, one of the most accelerated growths in the numbers of enrollees and credentials completed transpired during the Great Recession. For Coloradans, this was a time of booming interest in higher education, which was translated into a 19% increase (from 140,142 in the academic year of 2009 to 167,383 in 2011) in enrollment in Colorado public higher education institutions. The growth was as impressive when it comes to the number of completers, which increased from 29,844 to 35,389 (also a 19% increase from the previous year).

Just like the Great Recession, the pandemic has left fewer financial resources for Coloradans to take advantage of. Despite this scarcity, Coloradans are still entering and completing higher education pathways thanks to the institutions' efforts to virtualize educational environments. Therefore, it is projected that the number of enrollees and credentials completed in Colorado will continue to increase in the academic year 2021 and onward.

Higher Education Is Worth the Investment

Higher Education and the Labor Force Have Strong Ties

Higher Education and the labor force are not independent of each other. There is intersectionality of the labor force and education. Those with higher education typically participate in the labor force at a higher rate, usually have lower rates of unemployment, and have a higher annual wage compared to those without a postsecondary credential.

The following data uses estimates from the American Community Survey Public Use Microdata set and the Bureau of Labor Statistics. The data is largely self-reported; thus, it gives a general sense of what is happening in Colorado, but it is not definitive. This further highlights the importance of continued communication between job seekers, workforce centers, and education and training providers to supplement data to paint the full picture of what is happening in Colorado communities.

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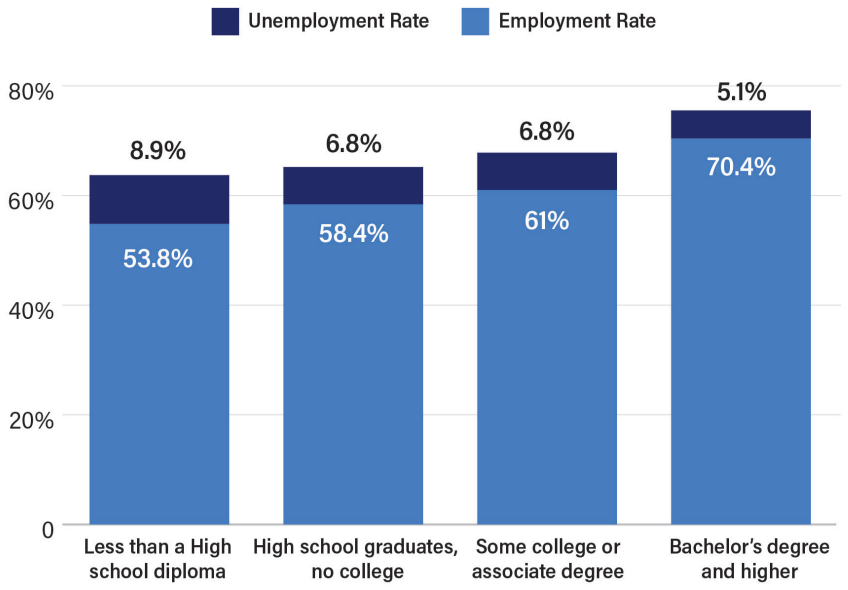
Labor Force Participation

Labor force participation rate is the percentage of the civilian noninstitutional population 16 years and older that is working or actively looking for work[2]. In looking at the intersectionality of the education and labor force participation rate, the rate includes only those 25 years and older.

Figure 1a shows the 2020 Colorado employment rates by education level. As attainment increases, employment rates increase; a higher percentage of the educated population is currently employed.

FIGURE 1a: 2020 Colorado Employment Rates by Education Level



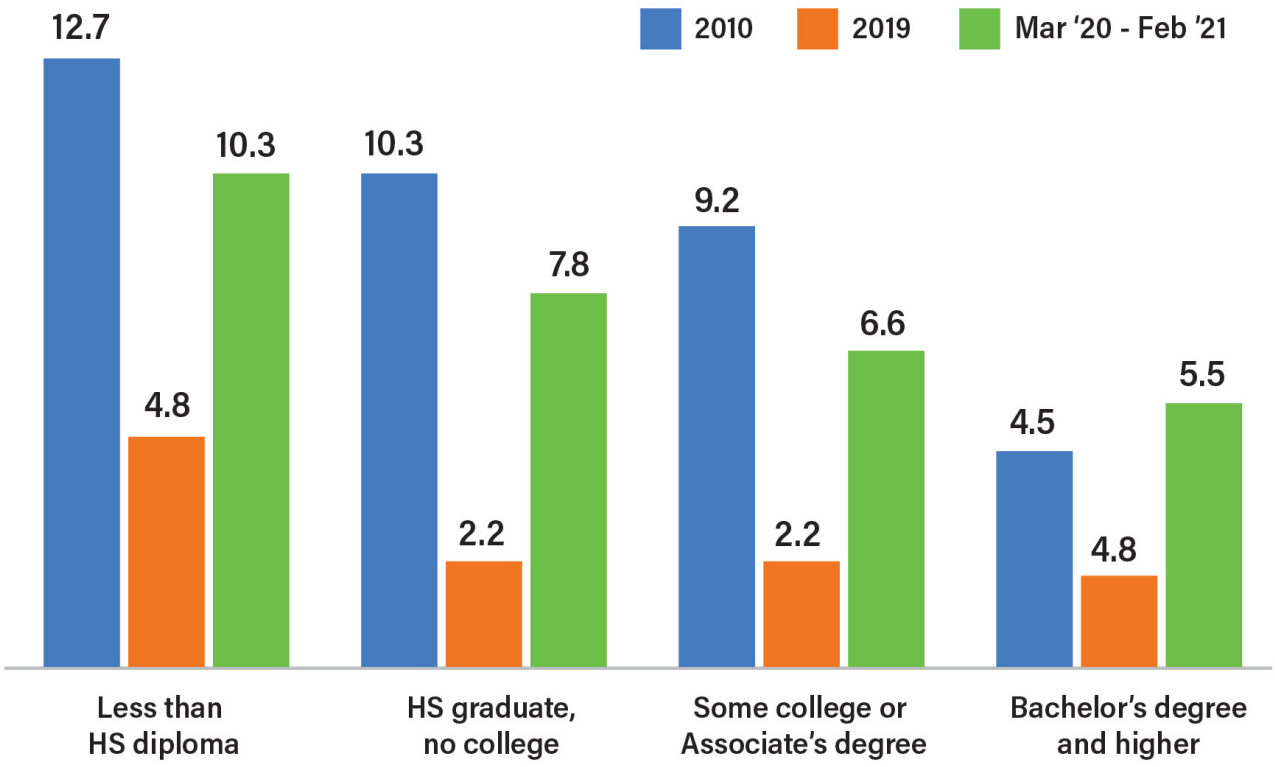
Source: Colorado Department of Labor and Employment: Office of Labor Market Information

Unemployment

Figure 1a also illustrates the unemployment rate for each education level. As education increases, employment rates increase, and unemployment rates decrease. The U-3 unemployment rate is the rate utilized in this analysis. It is also the official unemployment rate that is typically discussed in the news, economic releases, etc. The U-3 unemployment rate is defined as the total unemployed, as a percent of the civilian labor force[2].

Figure 1b compares Colorado's unemployment rates across different points in time. Not only do those with higher education have a lower unemployment rate in times of economic prosperity, but education is also resilient in times of economic contraction and recession. Specifically, those with a bachelor's degree or higher had the lowest unemployment rates during the peak of the Great Recession in 2010 and during the COVID-19 pandemic in 2020, showing an inverse correlation between education and unemployment (i.e., as education increases, unemployment decreases).

FIGURE 1b: Unemployment Rates by Educational Attainment



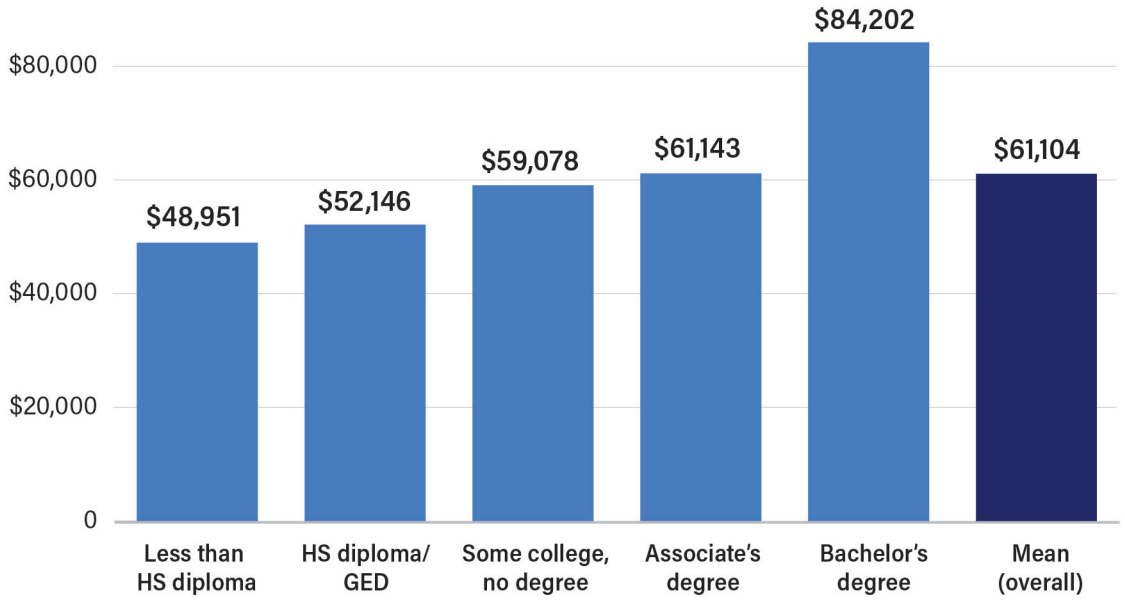
Source: Current Population Survey. Data not seasonally adjusted. Unemployment rates by educational attainment for individuals 25 and over.

Coloradans with a bachelor's degree of higher had the lowest unemployment rates during the peak of the Great Recession in 2010 and during the COVID-19 Pandemic in 2020,

Wages

In addition to the favorable employment outcomes, higher mean annual wages are associated with higher education. Figure 1c shows the mean annual wages of Coloradans making above minimum wage broken down by educational attainment. As education increases, mean annual wage increases. Those with a bachelor's degree have the highest average annual wage at $84,202 while those with less than a high school diploma earn $48,951 on average, a gap of $35,251.

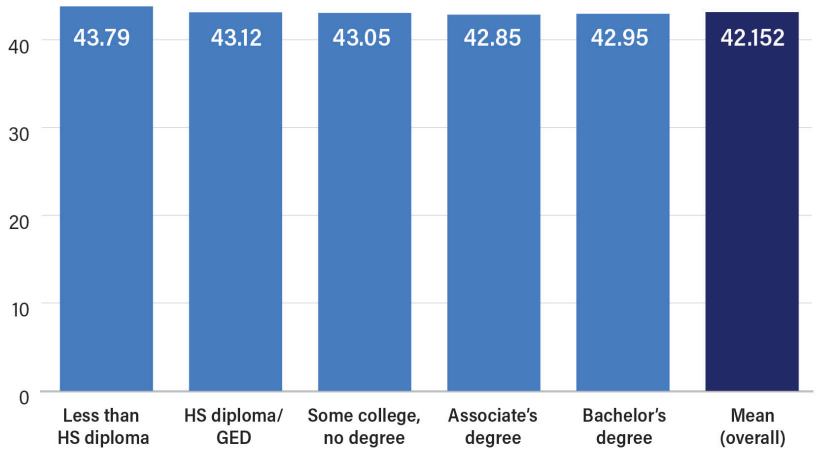
FIGURE 1c: Colorado Mean Annual Wage by Educational Attainment



Source: 2015-2019 5-year American Community Survey Public Use Microdata Set (ACS PUMS)

There is little variation between the average hours worked per week between different educational levels. In short, this means that those with higher education are making more but working about the same number of hours as those with different educational attainment levels (See figure 1d).

FIGURE 1d: Average Hours Worked Per Week by Educational Attainment



Source: 2015-2019 5-year American Community Survey Public Use Microdata Set (ACS PUMS)

Job Demand

Overall, there are more opportunities for those with higher education to occupy in-demand jobs with higher wages. The 2020 Talent Pipeline Report uses labor market projections from the Colorado Department of Labor and Employment (CDLE) Office of Labor Market Information to identify Top Jobs meeting three criteria:

- Projected High Net Annual Openings (>40)
- Above Average Growth Rate over 10 years (>10%)
- A Good Wage[9]

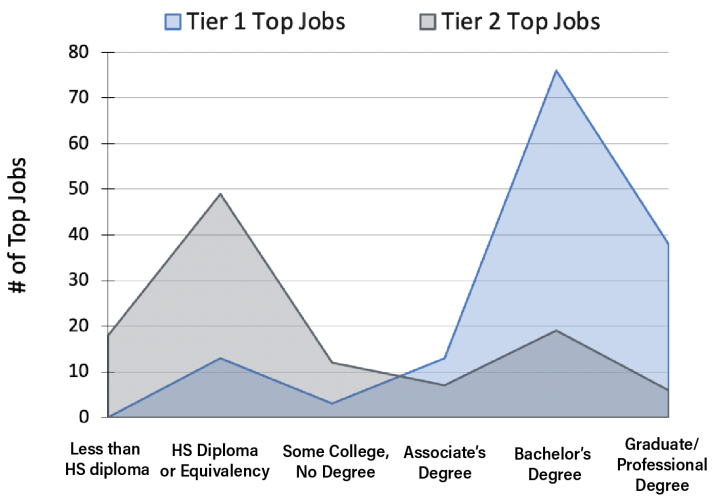
The jobs in this report are classified into two earning tiers:

- Tier 1 is a median hourly earning living wage benchmark of $25.88 or above; a level that supports two adults—one working—and one child.
- Tier 2 is a median hourly earning living wage benchmark of $13.43 or above; a level that supports an individual.

Statewide, there are 143 Top Jobs classified at Tier 1 and 111 Top Jobs classified at Tier 2. Additionally, median hourly earnings are correlated to the level of education or training individuals have in these occupations. Figure 1e illustrates the percentage of Top Jobs that fall into each educational attainment category. Of all the Top Jobs, 62.6% require a credential past high school. The figure further depicts that Tier 1 Top Jobs typically require higher education levels than Tier 2 Top Jobs, with a majority of Tier 1 Top Jobs (88.8%) requiring a credential past high school.

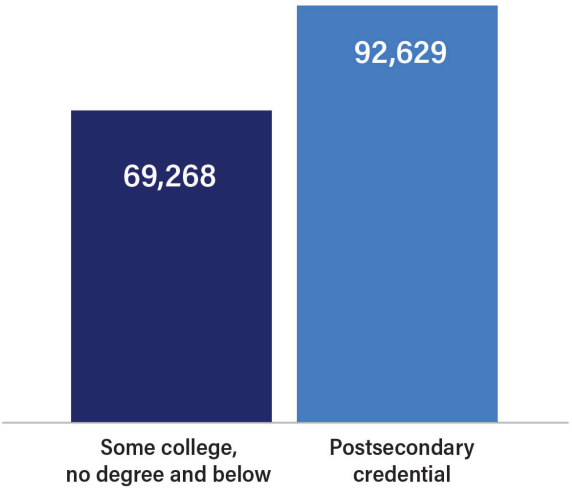
Figure 1f illustrates that these jobs are projected to have more annual openings, with occupations requiring a postsecondary non-degree award and above having an estimated 92,629 annual job openings compared to 69,268 annual openings for jobs requiring some college and no degree and below.

FIGURE 1e: 2020 Top Jobs by Typical Education



Source: Colorado Department of Labor and Employment: Office of Labor Market Information

FIGURE 1f: Colorado Estimated Annual Job Openings by Postsecodary Attainment



Source: Colorado Department of Labor and Employment: Office of Labor Market Information

Your Choice Matters

Making Data-Informed Decisions Elevates the Chance of Attaining a High Financial Return on Investment

The previous section demonstrates that in times of economic prosperity or recession, average credential earners in Colorado enjoy greater financial stability and higher wage premium than their non-credential peers. However, these credentials do not necessarily provide earners with equal financial return; wage outcomes from credentials in one program may be meaningfully lower than those in another program. When students major in programs without considering this differential impact, they may be at risk of realizing, toward the end of their education journey, that their investment will hardly pay off, financially. To help students be informed at the outset, this section provides information on short-term and long-term median annual wages* and minimum wage percentages of different programs from Colorado higher education institutions. While wage outcomes are one very narrow measure a higher education return, individuals must be able to make informed decisions.

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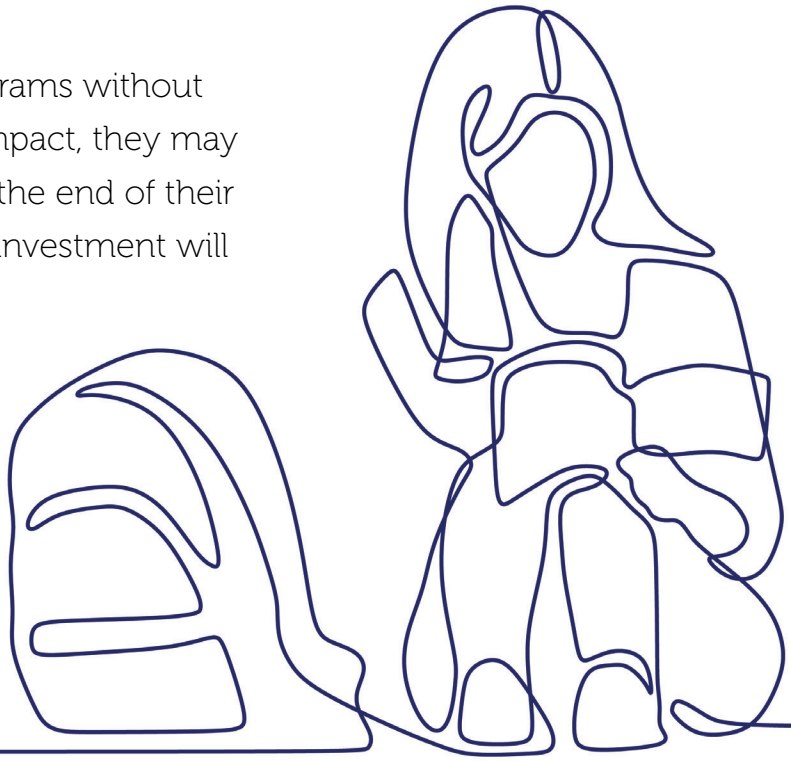


* Short-term and long-term wages refer to annual wages that graduates earned 1 year and 10 years after they graduated.

Understanding the ROI Dataset

The ROI dataset is created by linking CDHE's Student Unit Record Data System (SURDS) dataset to CDLE's Unemployment Insurance (UI) dataset through social security numbers (SSN). Although the dataset includes graduates from public institutions in Colorado, it excludes those meeting certain criteria: Graduates who do not have a SSN, who work outside of Colorado, who are federal employees or self-employed, and who meet the minimum wage threshold.

The ROI dataset has enabled Colorado to form a lasting partnership with the U.S. Census Bureau to spearhead a pilot project that involves nationwide degree completion datasets. The Postsecondary Employment Outcomes (PSEO) project leverages federal data linkages facilitated by the Census Bureau to provide national UI wage datasets on individuals who completed a degree program in Colorado, but who have left the state after graduation. This project allows Colorado to leverage an expanded data source to better inform students when they are making their education decisions.

Tables 2a and 2b show the annual median wages of programs grouped into 4 tiers. Tier 1 includes the top 25% of the programs based on this measure. Tier 2 includes the next 25%, tier 3 the next 25%, and tier 4 the bottom 25%. Short-term and long-term annual median wages specific to each program can be found in the tables below.

TABLE 2a: Annual median wage and minimum wage percentage by tiers from the two-year institutions.

Tier	Short-Term Median Wage ($)	Short-Term Minimum Wage Percentage (%)	Long-Term Median Wage ($)	Long-Term Minimum Wage Percentage (%)
1	47,404	64%	66,505	58%
2	38,603	47%	55,613	48%
3	33,588	36%	48,924	40%
4	25,690	30%	37,676	28%

Note: Minimum wage percentage is calculated by dividing the number of graduates who earned annual wages equal to or greater than the Colorado minimum wage cutoff by the total number of graduates.

TABLE 2b: Annual median wage and minimum wage percentage by tiers from the four-year institutions.

Tier	Short-Term Median Wage ($)	Short-Term Minimum Wage Percentage (%)	Long-Term Median Wage ($)	Long-Term Minimum Wage Percentage (%)
1	51,222	58%	81,910	55%
2	37,208	45%	62,387	47%
3	34,785	44%	53,864	45%
4	31,439	40%	49,871	41%

TABLE 2c: Short-term annual median wage and minimum wage percentage from graduates of two-year institutions in Colorado.

Program	Median Wage ($)	Minimum Wage Percentage (%)
Tier 1		
Construction Trades	49,370	74
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	48,836	66
Engineering Technologies and Engineering-Related Fields	43,542	52
Computer and Information Sciences and Support Services	42,805	51
Legal Professions and Studies	42,415	56
Science Technologies/Technicians	42,324	58
Tier 2		
Business, Management, Marketing, and Related Support Services	41,413	44
Precision Production	40,575	48
Social Sciences	39,371	56
Transportation and Materials Moving	38,018	36
Health Professions and Related Programs	37,448	47
Tier 3		
Agriculture, Agriculture Operations, and Related Sciences	36,783	24
Liberal Arts and Sciences, General Studies and Humanities	34,018	36
Mechanic and Repair Technologies/Technicians	32,607	40
Visual and Performing Arts	30,946	32
Foreign Languages, Literatures, and Linguistics	29,827	39
Tier 4		
Communications Technologies/Technicians and Support Services	27,583	27
Natural Resources and Conservation	26,488	29
Education	26,238	34
Personal and Culinary Services	25,145	27
Family and Consumer Sciences/Human Sciences	24,222	35

TABLE 2d: Long-term annual median wage and minimum wage percentage of graduates from two-year institutions in Colorado.

Program	Median Wage ($)	Minimum Wage Percentage (%)
Tier 1		
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	$69,377	62
Construction Trades	$66,841	62
Science Technologies/Technicians	$63,044	52
Engineering Technologies and Engineering-Related Fields	$61,360	50
Computer and Information Sciences and Support Services	$59,317	46
Tier 2		
Precision Production	$56,358	49
Legal Professions and Studies	$56,154	48
Health Professions and Related Programs	$56,003	48
Mechanic and Repair Technologies/Technicians	$52,692	50
Tier 3		
Business, Management, Marketing, and Related Support Services	$49,586	40
Liberal Arts and Sciences, General Studies and Humanities	$48,677	40
Communications Technologies/Technicians and Support Services	$47,925	32
Visual and Performing Arts	$47,598	36
Tier 4		
Agriculture, Agriculture Operations, and Related Sciences	$45,308	25
Natural Resources and Conservation	$41,521	36
Personal and Culinary Services	$35,842	29
Family and Consumer Sciences/Human Sciences	$34,209	31
Multi/Interdisciplinary Studies	$34,063	30

TABLE 2e: Short-term annual median wage and minimum wage percentage of graduates from four-year institutions in Colorado.

Program	Median Wage ($)	Minimum Wage Percentage (%)
Tier 1		
Computer and Information Sciences and Support Services	67,188	60
Engineering	60,985	54
Engineering Technologies and Engineering-Related Fields	58,731	67
Health Professions and Related Programs	57,099	66
Business, Management, Marketing, and Related Support Services	45,885	56
Mathematics and Statistics	43,413	53
Transportation and Materials Moving	43,380	47
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	40,592	54
Tier 2		
Physical Sciences	39,105	42
Public Administration and Social Service Professions	38,184	48
Theology and Religious Vocations	38,046	28
Architecture and Related Services	37,883	45
Education	37,152	61
Social Sciences	36,558	43
Agriculture, Agriculture Operations, and Related Sciences	35,835	43
Tier 3		
Communication, Journalism, and Related Programs	35,669	45
Multi/Interdisciplinary Studies	35,511	46
Natural Resources and Conservation	34,575	42
Liberal Arts and Sciences, General Studies and Humanities	33,984	52
Foreign Languages, Literatures, and Linguistics	33,812	40
Area, Ethnic, Cultural, Gender, and Group Studies	33,790	35
English Language and Literature/Letters	33,084	42
Tier 4		
Biological and Biomedical Sciences	32,437	40
Psychology	32,153	43
History	32,152	43
Family and Consumer Sciences/Human Sciences	31,111	41
Parks, Recreation, Leisure, and Fitness Studies	30,499	43
Visual and Performing Arts	29,116	34
Philosophy and Religious Studies	28,912	31

TABLE 2f: Long-term annual median wage and minimum wage percentage of graduates from four-year institutions in Colorado.

Program	Median Wage ($)	Minimum Wage Percentage (%)
Tier 1		
Computer and Information Sciences and Support Services	100,899	63
Engineering	97,182	52
Engineering Technologies and Engineering-Related Fields	90,598	63
Transportation and Materials Moving	78,609	44
Mathematics and Statistics	75,906	53
Business, Management, Marketing, and Related Support Services	75,515	56
Physical Sciences	69,503	41
Tier 2		
Health Professions and Related Programs	68,913	55
Architecture and Related Services	67,218	42
Biological and Biomedical Sciences	62,202	42
Communication, Journalism, and Related Programs	61,172	46
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	60,349	61
Natural Resources and Conservation	59,584	43
Social Sciences	59,288	45
Tier 3		
Agriculture, Agriculture Operations, and Related Sciences	58,333	38
Philosophy and Religious Studies	55,076	37
Parks, Recreation, Leisure, and Fitness Studies	54,657	49
Foreign Languages, Literatures, and Linguistics	54,104	41
Psychology	54,062	45
History	53,501	46
English Language and Literature/Letters	52,372	44
Tier 4		
Area, Ethnic, Cultural, Gender, and Group Studies	51,203	33
Multi/Interdisciplinary Studies	50,944	44
Visual and Performing Arts	50,709	35
Public Administration and Social Service Professions	50,693	48
Family and Consumer Sciences/Human Sciences	50,659	44
Education	46,650	46
Liberal Arts and Sciences, General Studies and Humanities	46,490	50

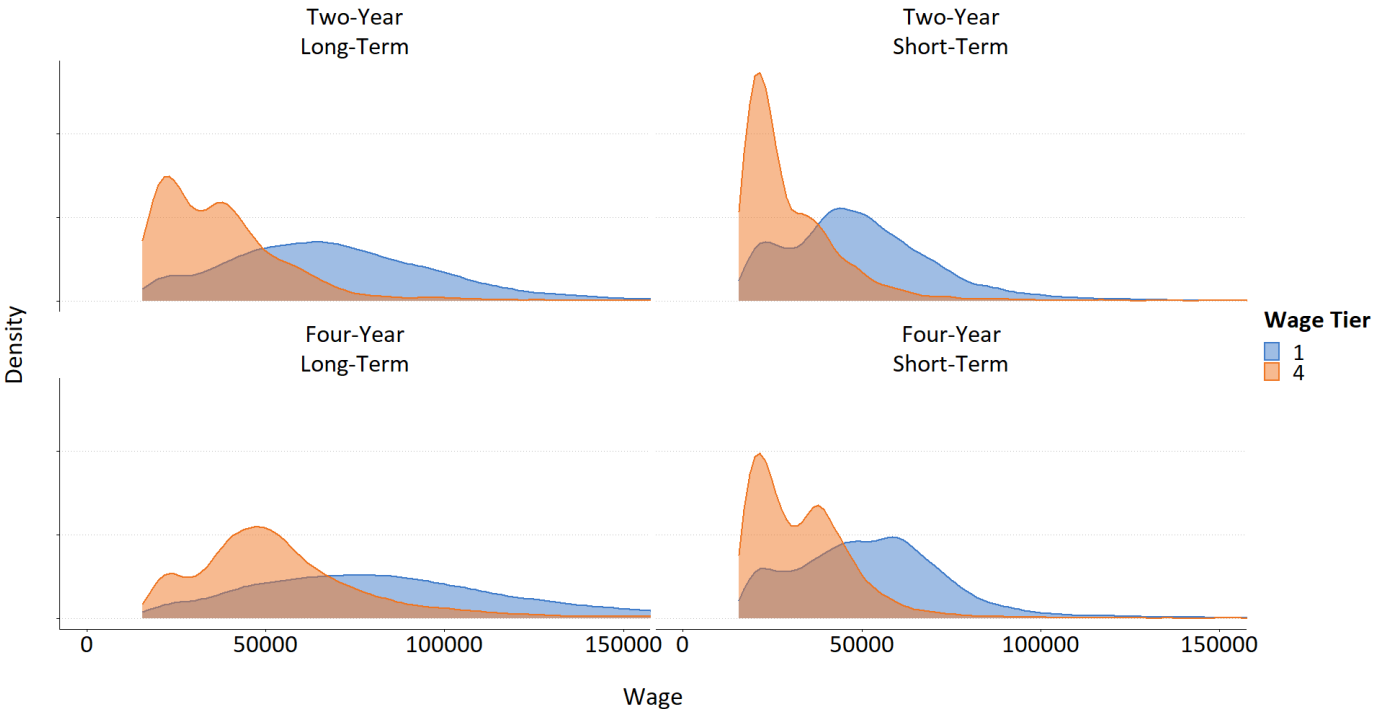
These tables suggest that differences exist among different programs regarding annual median wage. For example, within the 2-year institutions, Tier 1 programs boast an $8,801 short-term wage premium over the Tier 2 programs. Such a gap can also be observed in the long-term wages and the wages from the programs offered by the 4-year institutions. Based on these patterns, do graduates with degrees in the Tier 1 programs enjoy wage premium over their peers with degrees in the Tier 4 programs? Not necessarily.

Figure 2a shows distributions of short-term and long-term annual wages from the 2-year and 4-year institutions. Tier 1 and Tier 4 wage distributions are selected because they represent the most extreme and opposite ends of the wage spectrum thereby demonstrating the clearest difference. Within each graph, the distributions differ from one another in that the Tier 4 distributions are mostly concentrated on the left area of the spectrum while the Tier 1 are so on the right. However, these distributions are also similar in that 30% to 40% of their areas overlap.

When students are hesitant to major in a program from a lower Tier, they are encouraged to take a data-informed approach, i.e., compare the wage distributions between different Tiers, determine how much the distributions overlap, evaluate their chance of earning good returns, and determine if they want to follow their passion or not based on the evaluation.

Committing to a program should not exclusively depend on future wage outcomes. While it is important to aim for a high wage, it is also important to become a well-rounded and informed person capable of fully participating in modern society. Students investing in programs that foster soft skills, namely oral/written communication, critical thinking, ethical judgment, teamwork, and real-world application of academic knowledge[10, 11] generate both public and private good. These skills not only cut across majors and enhance students' undergraduate and professional experiences; they provide a seat at the table in leading our society. They are also highly sought after by employers.

FIGURE 2a: Inflation-Adjusted Wage Distribution of Students in Two-Year College, One Year after Graduation



Affordabililty for All

Colorado Has Created Many Options for All Coloradans to Benefit from Higher Education

The increasing cost of higher education means that to increase educational attainment, college must be more affordable. Education needs to be within reach. Although cost increases at public colleges have leveled out recently, tuition increases have far outpaced inflation for many years[12].

Nationally, the published "sticker price" for yearly tuition and fees at public two-year institutions grew from $3,260 in 2010-11 to $3,770 in 2020-21 (a 16% increase). During that same period, tuition at four-year institutions across the U.S. grew 16%, from $9,070 to $10,560[12]. In Colorado, these numbers are more dramatic, with yearly tuition and fees at public two-year institutions growing by 35% (to $4,755) and yearly tuition and fees at public four-year institutions increasing by 46% (to $11,174).

There are many reasons for these national and state-level trends. Notably, the most dramatic tuition increases at public colleges happened between 2009 and 2012, when states, faced with declining revenues due to the Great Recession, dramatically cut higher education budgets. During that time, higher education appropriations declined 24.2% nationally. While state funding for higher education has increased since 2012, it has yet to reach pre-recession levels. Higher education institutions offset decreases in state appropriations by raising tuition; the student share of higher education revenues nationwide increased from 35.7% in 2008 to 44% in 2020. Nationally, state funding for higher education remains 6% below the pre-recession high point of early 2008[13].

While the state budget has recovered from COVID-19 impacts sooner than expected, allowing for a 9.7% increase to operating funding in the upcoming 2020-21 fiscal year, Colorado has a highly constrained budget environment even in "normal" years, and regular increases to higher education funding are not guaranteed. This is why it is important for institutions to pursue the policies outlined in the Roadmap to Containing Costs and Making College Affordable, a bold plan that helps postsecondary institutions rethink traditional models and create structures for more efficient and affordable postsecondary education.

Read more: https://highered.colorado.gov/Publications/Reports/Roadmap-to-Containing-College-Costs-and-Making-College-Affordable.pdf

Cost of Attending College[14]

Tuition and Fees
In 2018-19, published in-state tuition and fees at Colorado's four-year institutions are about $10,500 per year, and tuition at two-year institutions are $4,100.

Living Expenses
Where a student lives makes a difference. At Colorado's four-year institutions, cost estimates for students who choose to live on campus (reported cost of $11,400) or independently ($10,900) are higher than room and board for students living at home. At two-year institutions, reported housing costs are, on average, $7,400 on campus and $11,500 independently. Living at home can significantly reduce a student's housing costs.

Books and Supplies
Colorado's four-year institutions reported average books and supplies costs of $1,500, and two-year institutions reported average books and supplies costs of $1,700.

Other Costs
There are other costs that students incur while pursuing their education, including but not limited to expenses on transportation, furnishings, laundry, and entertainment. Estimated other expenses vary by living situation but range from $3,300 to $5,300.

Total cost of attendance
Collectively these costs are added together as the Total Cost of Attendance. Institutions use this cost as well as a student's family income to determine financial aid levels. Very few students pay the total cost of attendance; almost all receive a mix of federal, state and college-funded grants and scholarships, otherwise known as financial aid.

Net price
The total cost of attendance, subtracting financial aid, is referred to as a student's net price. The net price is what a student and their family pay of-out-of-pocket using savings, income from work, and in some cases student loans.

Because the state and its institutions are committed to affordability for in-state students, many students—particularly those from low-income families—pay little, if no tuition, and end up with a significantly lower net price overall (table 3b). To ensure affordability, institutions in Colorado should direct financial aid resources to low-income students. In Colorado, almost all students whose family income is less than $48,000 and who apply for aid receive some type of financial aid from the federal government, the state, or the institution.

TABLE 3a: Average Yearly Cost Based on Posted Net Price

AVERAGE COST 2-YEAR Institutions	
TUITION AND FEES	$4,100
INDEPENDENT OFF-CAMPUS HOUSING	$11,500
BOOKS AND SUPPLIES	$1,700
OTHER COSTS (OFF-CAMPUS)	$5,200
TOTAL COST OF ATTENDANCE	$22,500

AVERAGE COST 4-YEAR Institutions	
TUITION AND FEES	11,500
INDEPENDENT OFF-CAMPUS HOUSING	$10,900
BOOKS AND SUPPLIES	$1,500
OTHER COSTS (OFF-CAMPUS)	$3,600
TOTAL COST OF ATTENDANCE	$26,500

Source: Integrated Postsecondary Education Data System

TABLE 3b: Percent of Students Receiving Aid by Income

	2-Year Institutions		4-Year Institutions	
	% Receiving Aid	Average $ Awarded	% Receiving Aid	Average $ Awarded
$0-30,000	100%	$7,800	100%	$12,000
$30,001-$48,000	98%	$7,200	99%	$11,600
$48-001-$75,000	91%	$5,300	93%	$9,300
$75,001-$110,000	53%	$3,000	66%	$5,200
$110,000 or more	28%	$2,500	49%	$3,500

Source: Integrated Postsecondary Education Data System

The following figures show how much the average students pays (net price) after they receive financial aid.

FIGURE 3a: Average Aid Received and Net Price After Aid, 2-Year Institutions (Off-Campus)

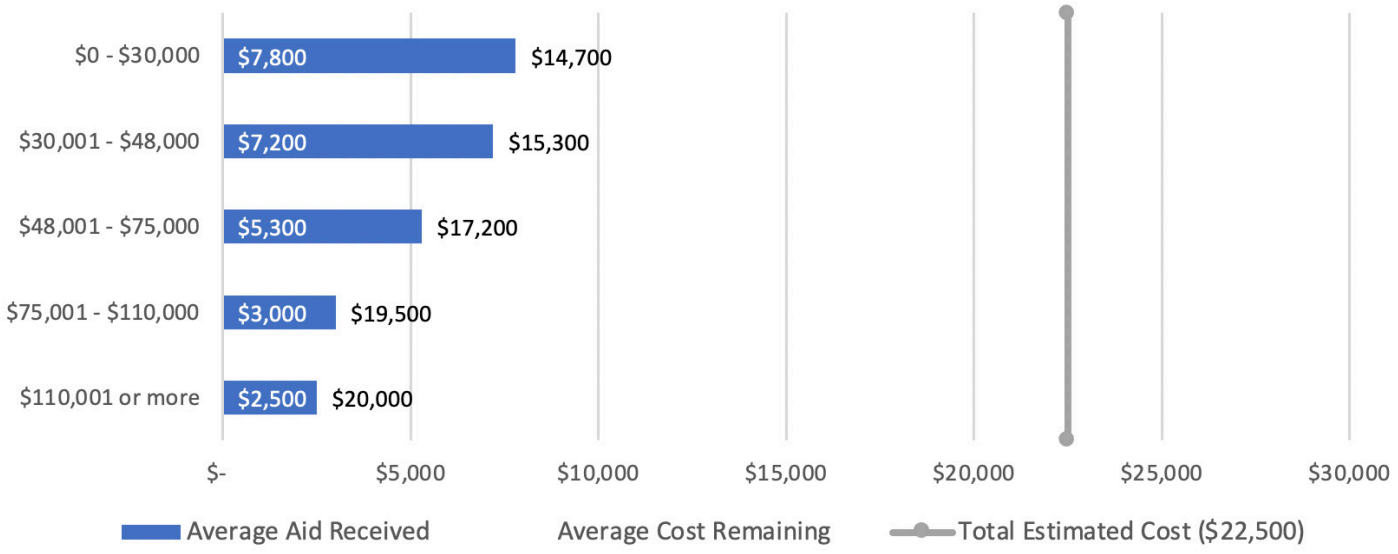
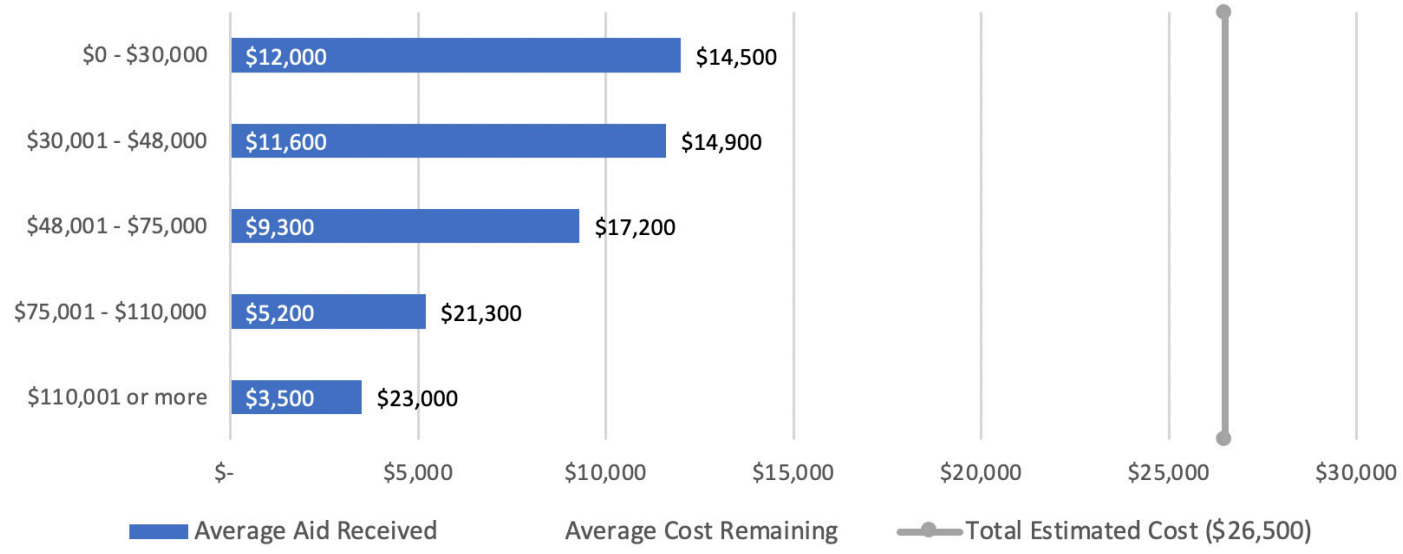
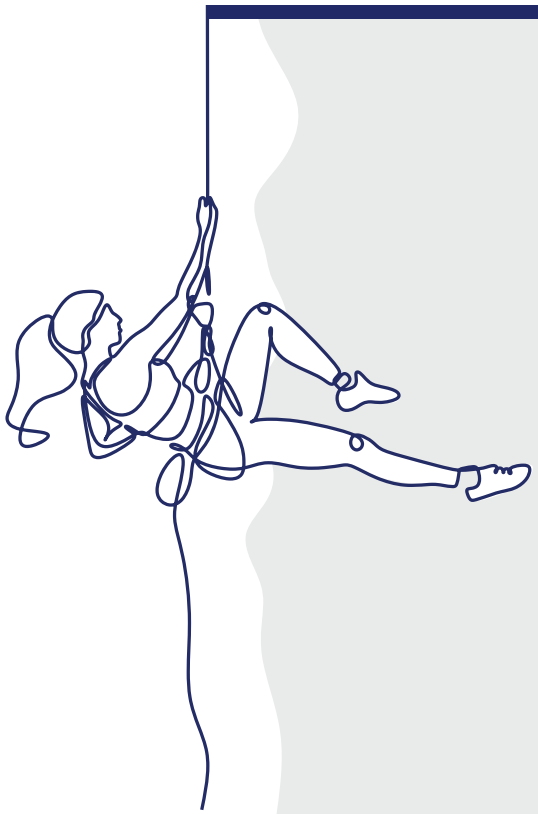


FIGURE 3b: Average Aid Received and Net Price After Aid, 4-Year Institutions (Off-Campus)



Source: Integrated Postsecondary Education Data System.



Scholarship and Grants

Scholarships and grants are important tools for lowering the net price of postsecondary education. They can be awarded for a variety of reasons, such as financial need, academic merit, or achievements in athletics or the arts. Unlike loans, scholarships and grants do not need to be paid back.

Students attending institutions of higher education in Colorado can receive scholarships and grants from several sources: The federal government, the state government, and institutions themselves all dedicate funding to grant-based financial aid. Students can also seek aid from private sources. The following bar chart shows the amount of grant aid distributed to resident undergraduate students with a Free Application for Federal Student Aid (FAFSA) at Colorado institutions by source in the 2019-20 academic year. In total, this group of students received $629.8 million in grant aid in 2019-20.

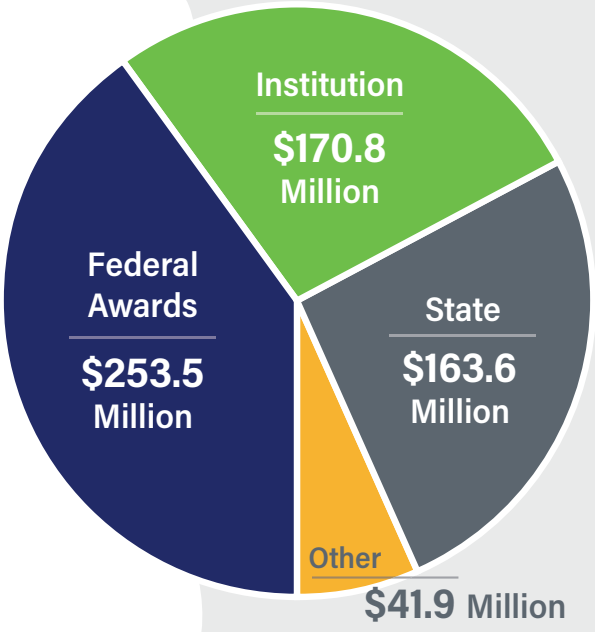


FIGURE 3c: Grant Money Awarded by Source FY, 2019-20

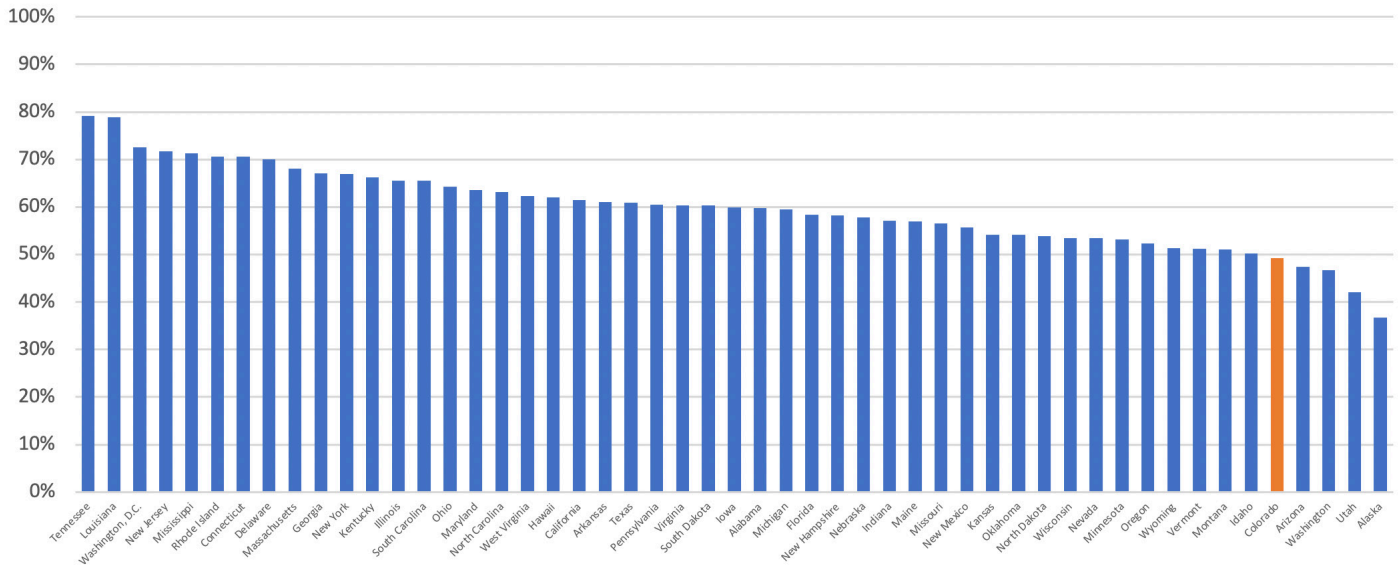
In total, this group of students received $629.8 million in grant aid in 2019-20.

The most important thing a student can do to qualify for grant aid is complete the FAFSA. As noted in the Roadmap to Containing College Costs and Making College Affordable, Colorado ranks 47th in the nation in FAFSA completion (figure 3d), meaning that Colorado students miss out on millions of dollars in federal, state, and institutional financial aid each year. And because FAFSA completion is a requirement for most need-based state aid as well, students who do not complete a FAFSA also forgo this source of funding. The Department has resources available for students, families, and educators on how to complete the FAFSA available through My Colorado Journey.

The Colorado Application for State Aid (CASFA) allows ASSET students (and other students ineligible to complete a FAFSA) to apply for institutional and, in some cases, state-funded financial aid.

Read more: https://www.mycoloradojourney.com/journey/get-your-piece-of-the-pie

FIGURE 3d: Percentage of Senior Class Completing FAFSA*



Colorado ranks 47th in the nation in FAFSA completion, meaning that Colorado students miss out on millions of dollars in federal, state, and institutional financial aid each year.

*Note. The data come from the NCAN FAFSA Tracker 2020-21 Cycle Through September 11, 2020.

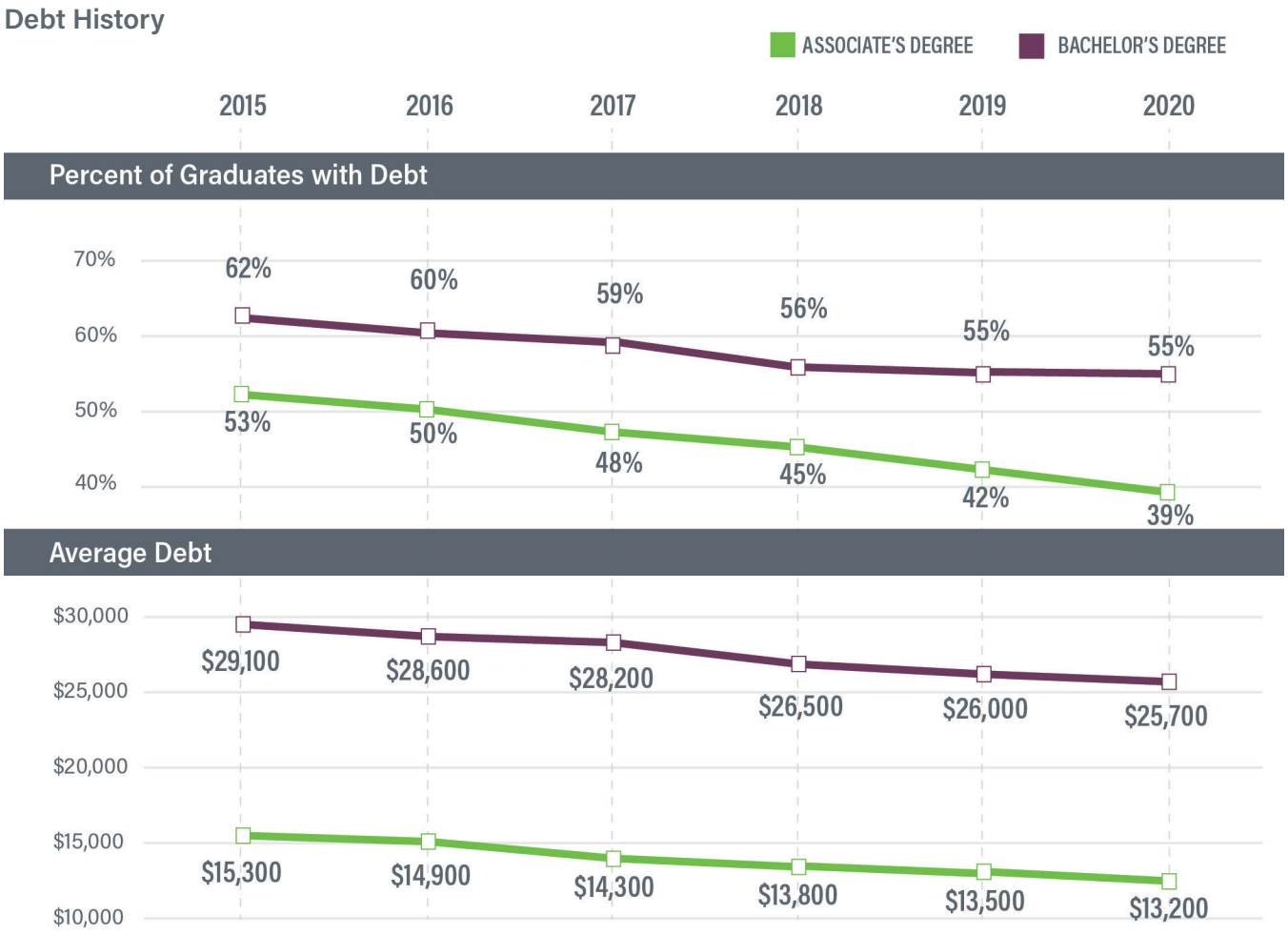
Student Debt

To pay for college, families, and students depend on private scholarships, savings, income earned while a student is enrolled in school, and, increasingly, student loan debt. Recent reports by the New York Federal Reserve show that student debt is one of the fastest-growing forms of debt nationally.

Bucking these trends, debt among Colorado residents graduating from the state's public institutions continues to be on a steady downward trend since 2014 (figure 3e).

In 2020, 55% of resident students graduating from a four-year institution and 39% of resident students graduating from a two-year institution accrued student loan debt. Statewide at all institution types, 50% of students graduated with loan debt in 2020—which means that 50% of resident students graduated with no loan debt at all. In 2020, the average student loan debt for a Colorado student graduating with a bachelor's degree was approximately $25,700.

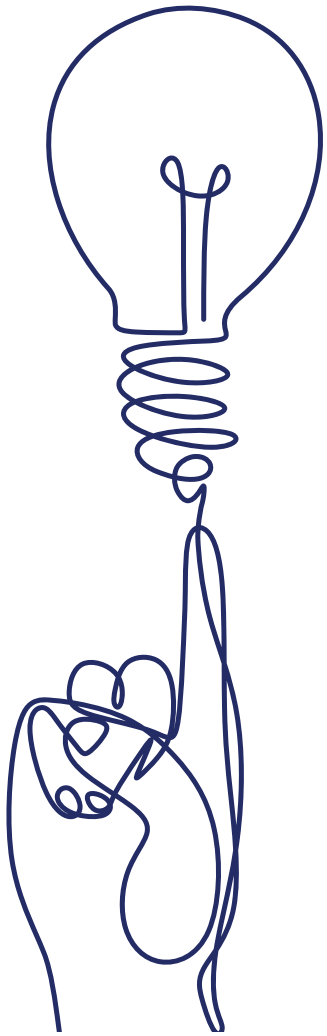
FIGURE 3e: Debt by Program Type



Note: The data come from the Student Unite Record Data System's financial aid file linked to degree file. Figures include inflation-adjusted numbers for students graduating with debt who were classified as resident students at the time of their graduation

When including graduate student debt and debt brought to the state after attending private nonprofit, for-profit, and out-of-state public institutions, more than 700,000 Coloradans owe a collective $26.4 billion in outstanding student debt. While these numbers may be shocking at first sight, it is important to recognize a few important distinctions. First, not all this debt was accumulated by undergraduate students at Colorado public institutions. About 40% of federal student loans go to graduate students, most of whom receive significantly higher returns for their degrees.

Additionally, these figures include people who move to Colorado from out-of-state and Colorado students who pursue degrees at higher-cost private institutions. Finally, it is important to keep in mind that not all debt is problematic. Debt can also be a helpful tool for completion since it allows students to enroll in more credits and improves their likelihood of success[15]. While it is true that the collective loan burden of Coloradans is a large figure, under 10% of bachelor's degree graduates and less than 1% of community college students acquired more than $40,000 in debt after graduating from a Colorado public institution.



2020 Associate Degree Graduates	2020 Bachelor's Degree Graduates
▪ 39% of graduates graduated with debt	▪ 55% of graduates graduated with debt
▪ Average debt - $13,200	▪ Average debt - $25,700
▪ Just 2% of graduates accrued debt greater than $30,000	▪ Just 8.5% of graduates accrued debt greater than $40,000

While it is true that the collective loan burden of Coloradans is a large figure, under 10% of bachelor's degree graduates and less than 1% of community college students acquired more than $40,000 in debt after graduating from a Colorado public institution.

Debt can be an important tool to achieve affordability if students finish what they start. Students who do not graduate are more likely to default than completers—24% versus 9%, respectively[16]. Among those who default, two-thirds default on less than $10,000[11].

Encouraging timely completion, providing more intensive wraparound services, and building targeted loan forgiveness programs will help more Coloradans meet their obligations, avoid default and benefit from credential completion. To stave off default risk, Colorado leaders and policymakers should continue to discuss stronger protections for student borrowers at both the state and federal levels. And since the riskiest type of loan debt to have is debt without a degree, policymakers should continue to focus on methods to improve graduation rates in Colorado.

Just **9%**
of college graduates
default on their loans

compared to

24%
of students who don't
complete their degree

Two-thirds of people who default on their student loan debt accrue less than $10,000.

Default Information on Graduates Vs Students Who Drop out

INCOME-DRIVEN REPAYMENT (IDR):
These plans make payments manageable by basing them on a borrower's ability to pay. Graduates pay lower amounts over a longer period and may qualify for loan forgiveness at the end of the loan term (typically after 15 to 25 years). Approximately 32% of borrowers in repayment of federal Direct loans (comprising 53% of federal Direct loan dollars) participated in income-driven repayment in 2020. While this number is an increase (in 2014, just 13% of borrowers were enrolled in an IDR plan), the administrative complexity of enrolling in IDR plans continues to be a barrier for greater participation[17].

STUDENT LOAN FORGIVENESS:
The federal government allows teachers in high-need areas and individuals who work in public service for more than 10 years to have their student loans forgiven after a shorter time frame if they meet the program requirements.

Why does the average debt seem less than what is often reported nationally?
These data reflect federal undergraduate debt taken on by resident students attending Colorado public institutions. Debt accrued while attending graduate school, private schools, for-profit educational institutions, or out-of-state institutions inflates averages reported in other sources. These data also do not include private loans students may have taken out to finance their education.

Social Determinants of Student Success

Students in postsecondary education face various challenges as they work to complete their credentials. Students are increasingly challenged in their goal of completing credentials by factors including (but certainly not limited to) food insecurity, housing insecurity/homelessness, and mental health needs.

A recent survey of Colorado community colleges by the Hope Center for College, Community, and Justice found that:

- 40% experienced food insecurity in the prior 30 days
- 55% experienced housing insecurity in the previous year
- 16% experienced homelessness in the previous year

These (and various other) social determinants can significantly impact a student's ability to progress through a postsecondary education program and widen equity gaps in terms of postsecondary and workforce outcomes. These barriers have been exacerbated due to the impacts of COVID-19. Addressing these social determinants of student success can help propel student success by meeting students where they are and better addressing their needs.

Recently, CDHE released Hunger Free and Healthy Minds campus checklists. These checklists elevate best practices for campuses to meet the food security and mental health needs of students. Subsequently, four campuses—Colorado State University, Colorado State University Pueblo, Fort Lewis College, and Metropolitan State University of Denver earned Hunger Free and Healthy Minds designations for their work to end hunger and address the mental health needs of their students.

Increasing enrollment and use of various public benefits is one way to address these social determinants of student success through leveraging federal dollars. Various postsecondary students may be eligible for public benefits programs (like SNAP, TANF, WIC, Medicaid, etc.) but many do not know they are eligible and/or don't know how to enroll. The use of public benefits can act as a "third leg" of financial aid for students and as short-term support towards helping them complete work on their postsecondary credentials. By supporting a student's work towards credential completion, public benefits can be an integral intervention to help them get across the "finish line" and have access to better long-term workforce opportunities (and potentially higher wages), thereby breaking a cycle of dependence on public benefits programs. Expanded and collaborative outreach to get more postsecondary students enrolled in public benefits programs is necessary to reach these goals.

Time and Credits to Credential

Students can dramatically reduce the cost of education by reducing the time and credit load it takes to complete a postsecondary credential—a strategy that also increases their likelihood of success.

To ensure affordability and maximize the financial ROI of a credential, students and institutions should:

- Act to reduce the time it takes to complete to ensure students realize the increased wage earnings they receive from a degree sooner.
- Minimize the number of credits students take beyond what is required to complete a credential to ensure they are not paying more tuition or take longer than they need to.

Largely due to Colorado's long-standing statewide transfer and articulation agreement framework, prior learning assessment opportunities, and accelerated remedial education strategy, Colorado has made strides towards enabling students to complete credentials faster and with fewer credits. In addition to clear transfer pathways, Concurrent Enrollment and Prior Learning Assessment can also be used to reduce the time needed to obtain a degree. However, as these programs grow, it is useful to track credits to completion to attempt to limit students from unintentionally accumulating credits that will not be applied to their degree. Because there are some advantages in taking exploratory credits, taking some credits beyond typical degree requirements is appropriate. However, institutions need to ensure that they are supporting students in making decisions intentionally and that excess credits do not increase the costs of a degree.

Key Student Decisions

40% of concurrent enrollment students complete 12 or more credits, reducing time to degree by at least a semester and saving them money. The 2019-2020 estimate is $4,420 in 4-year tuition or $2,083 in 2-year tuition.[18]

Adult students may save time and money by using Prior Learning Assessment to get credit for work, military, or other experience.

Research shows that colleges can be more affordable and improve outcomes by helping students enroll in a major early in their degree program and accumulate program-specific credit sooner.

Higher Education and Equity in Colorado

Colorado Is Progressing towards Creating a More Equitable Workplace

Assessing Equity Outcomes

When assessing equity in outcomes related to education, median wage is often used. A typical use case of assessing median-based equity between two groups involves producing two medians, one from each group, and calculating their difference. Any difference is interpreted as evidence of inequity and a basis on which policies to close the gap are designed.

Median is popular because it is easily comprehensible and a convenient way of representing a group. However, ease of comprehension and convenience alone cannot substantiate relying on this measure to design policies that address equity. The reason is that the median effectively represents a group only if the group meets two conditions: (1) it is normally distributed and (2) it has a narrow spread.

A group with a normal distribution and a narrow spread has most of its constituents (68% of the total) concentrate around its median (figure 4a). Satisfying these conditions give confidence in the median's ability to effectively represent its group. When two groups meet these conditions (i.e., being normally distributed and having a narrow spread), it may be concluded that the difference between their medians likely underscores a real difference between them. As figure 4b shows, the constituents are concentrated around their group medians and thus the two distributions overlap only a small area (shaded region).

FIGURE 4a: Simulated Normal Distribution

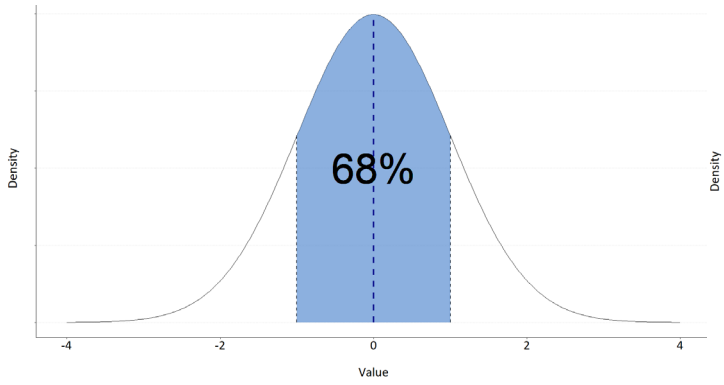
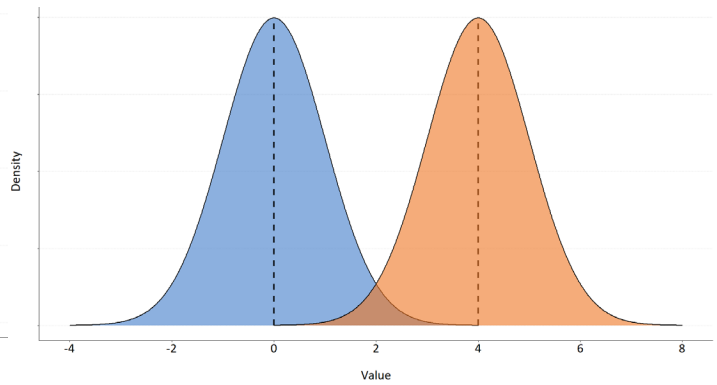


FIGURE 4b: Simulated Normal Distribution of Two Groups

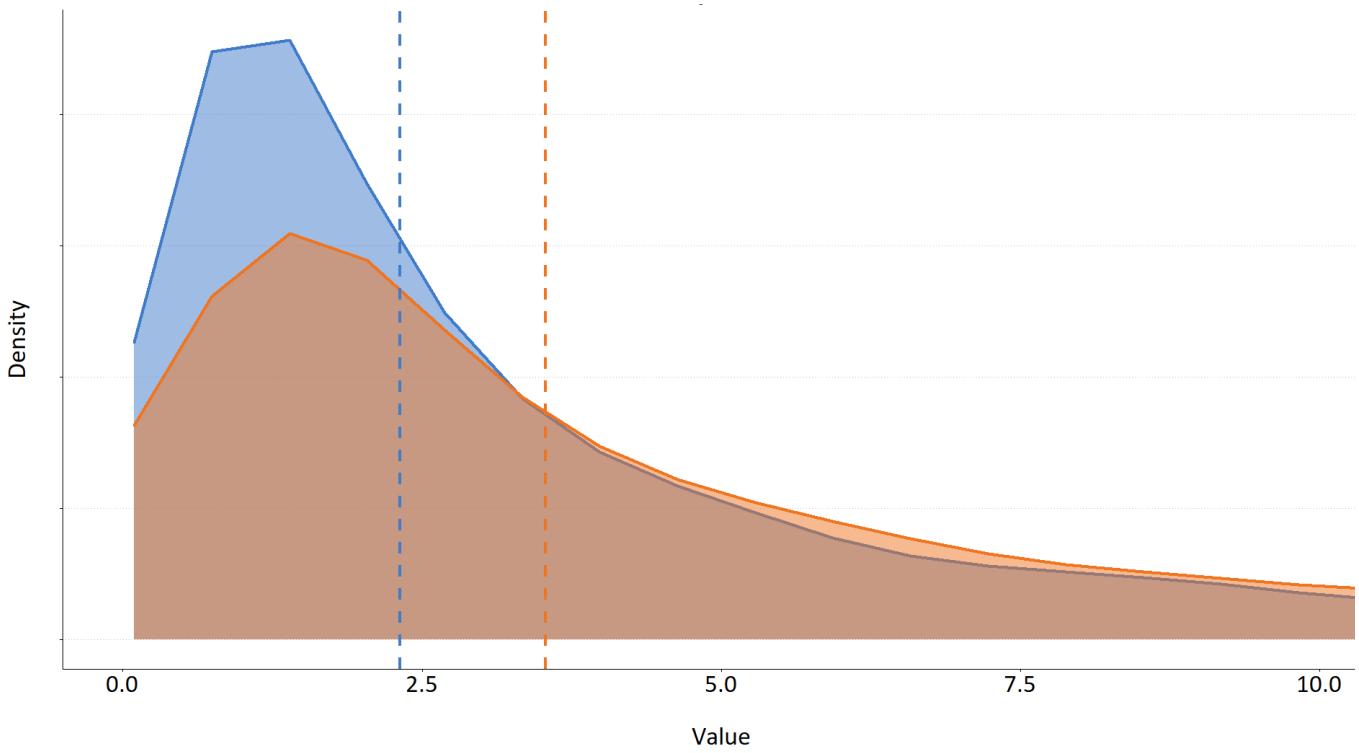


Note: Majority (68%) of the constituents concentrate around the median, i.e., within 1 standard deviation from the median.

Overlap characterizes similarity between two groups. The larger the overlap is, the more similar the groups become. Conversely, the smaller it is, the more dissimilar they become. Overlap is quantified by the 'overlapping index' which is a percentage of an area that the distributions of the groups intersect each other[19].

What happens when two groups are not normally distributed and have large spreads? Figure 4c shows that their constituents fail to concentrate around the medians, and thus significant areas of the distributions intersect each other. In other words, the medians poorly represent their groups that fail to meet the two conditions. Consequently, it may not be concluded that the difference between the medians likely underscores a real difference between the groups. However, it may be concluded that the two groups are much more alike than distinct.

FIGURE 4c: Simulated Inverse Gaussian Distribution of Two Groups



Note. The distributions are not normal and have large spreads. Although their medians are different from each other, there is a large overlap between the groups.

Numerous reports on equity heavily rely on medians without considering distributions and overlaps[20]. When medians fail to adequately represent groups (i.e., when the distributions are not normal and the spreads are large), any conclusions therefrom may unintentionally exaggerate inequity. When medians become the only measure of equity, these reports may inadvertently underappreciate the painstaking efforts many have made to help society march toward equity. Therefore, consideration of distribution overlap is included in this report.

Equity in Wage Outcomes: Gender

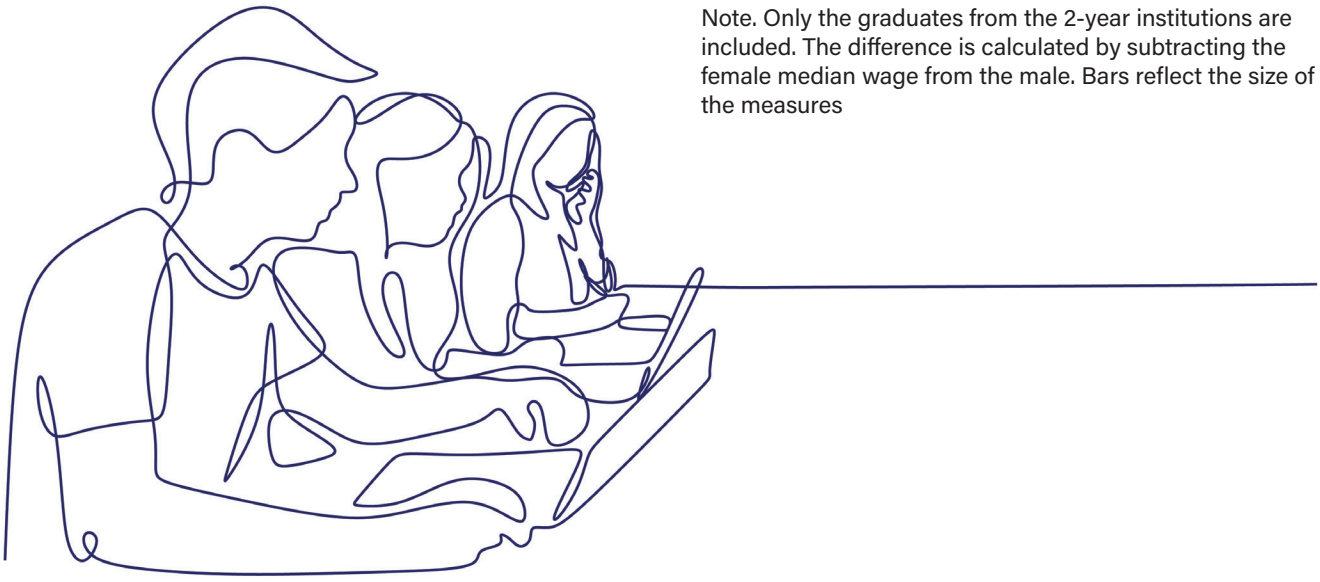
CDHE strives to better appreciate the collective efforts the state government, institutions of higher education, businesses, and students make to establish equity across gender and ethnicity (more specifically, equity in the returns on investment in higher education). As an extension of this consideration, this section addresses equity in wage across gender and ethnicity by complementing differences in medians with shapes of distributions and overlapping indices.

Table 4a shows the differences in the short-term* median wages by gender from cohort years 2015 to 2019. These wages were earned by graduates from 2-year public institutions in Colorado. The steady difference may prompt the reader to conclude that the males consistently earned $6,500 - $8,500 more than the females did. However, this conclusion overemphasizes the difference because the medians do not fully represent their groups: the wage distributions are not normal, and their standard deviations are large in all cohort years (figure 4d). Therefore, overlapping index is used to complement the differences in the medians.

TABLE 4a: Difference in Gender on Short-Term Annual Median Wage and Overlapping Index

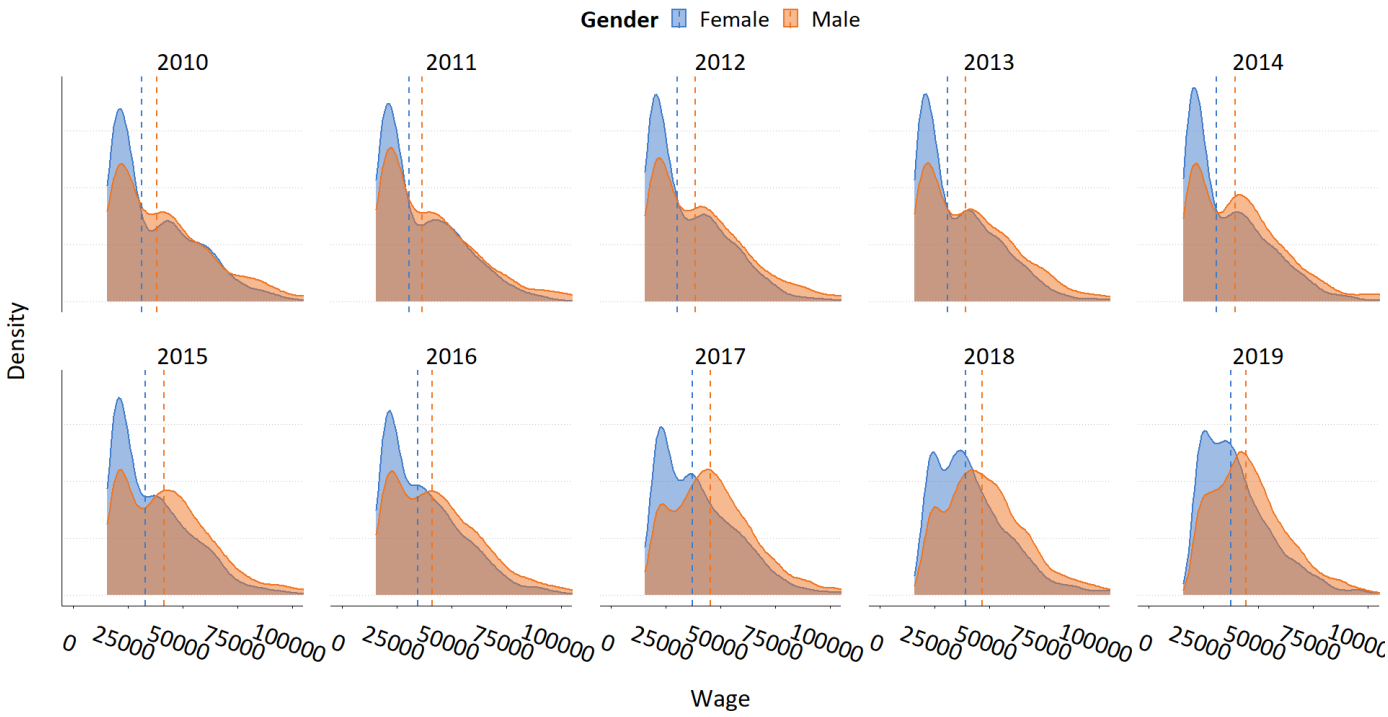
Cohort Year	Median Wage Difference	Overlapping Index
2019	**6,960**	**70**
2018	**7,695**	**71**
2017	**8,507**	**69**
2016	**6,555**	**77**
2015	**8,419**	**73**
2014	**8,610**	**76**
2013	**8,392**	**78**
2012	**8,153**	**79**
2011	**5,956**	**84**
2010	**6,896**	**81**

Note. Only the graduates from the 2-year institutions are included. The difference is calculated by subtracting the female median wage from the male. Bars reflect the size of the measures



*Short-term wage refers to annual wage graduates earned 1 year after graduation.

FIGURE 4d: Distributions of Short-Tem Annual Wage of Graduates from Two-Year College by Gender



Note: The distributions represent the graduates from cohort year 2010 to 2019. The dashed lines represent the medians of the distributions.

Over the past 10 cohort years, 69%-84% of the female and male wage distributions overlapped. In other words, most graduates experienced equity in the short-term wage across gender. However, 16%-31% of graduates still experienced inequity. Furthermore, the overlapping index gradually decreased by 11 percentage points from 81% in 2010 cohort year to a decade low of 70% in 2019.

Similar patterns can be observed from the short-term median wages and overlapping indices of graduates from the 4-year public institutions (see figures 4e and 4f on page 36):

- Based on the medians only, males enjoyed a higher wage premium than females, which steadily increased.
- However, the medians poorly represented the gender groups. Therefore, equity could not be accurately assessed based on their differences alone.
- Large overlaps between female and male wage distributions reflect that most of the graduates experienced equity.
- Gradual decrease in the overlapping index suggests that the proportion of graduates who experience inequity gradually increased.

Like the short-term median wages, the long-term median wages were greater for male graduates. For two-year graduates, this difference remained steady between cohort years 2004 and 2010. However, it decreased from $14,437 to $11,261 for four-year graduates during the same period.

As expected, the medians did not fully represent their distributions. Hence, overlapping indices were used. Unlike the overlapping indices of the short-term wages, those of the long-term either increased from 65% to 71% for 2-year institutions or remained steady around 64% for 4-year institutions (light and dark blue lines on figure 5f).

FIGURE 4e: Differences in Annual Median Wages of Graduates by Gender

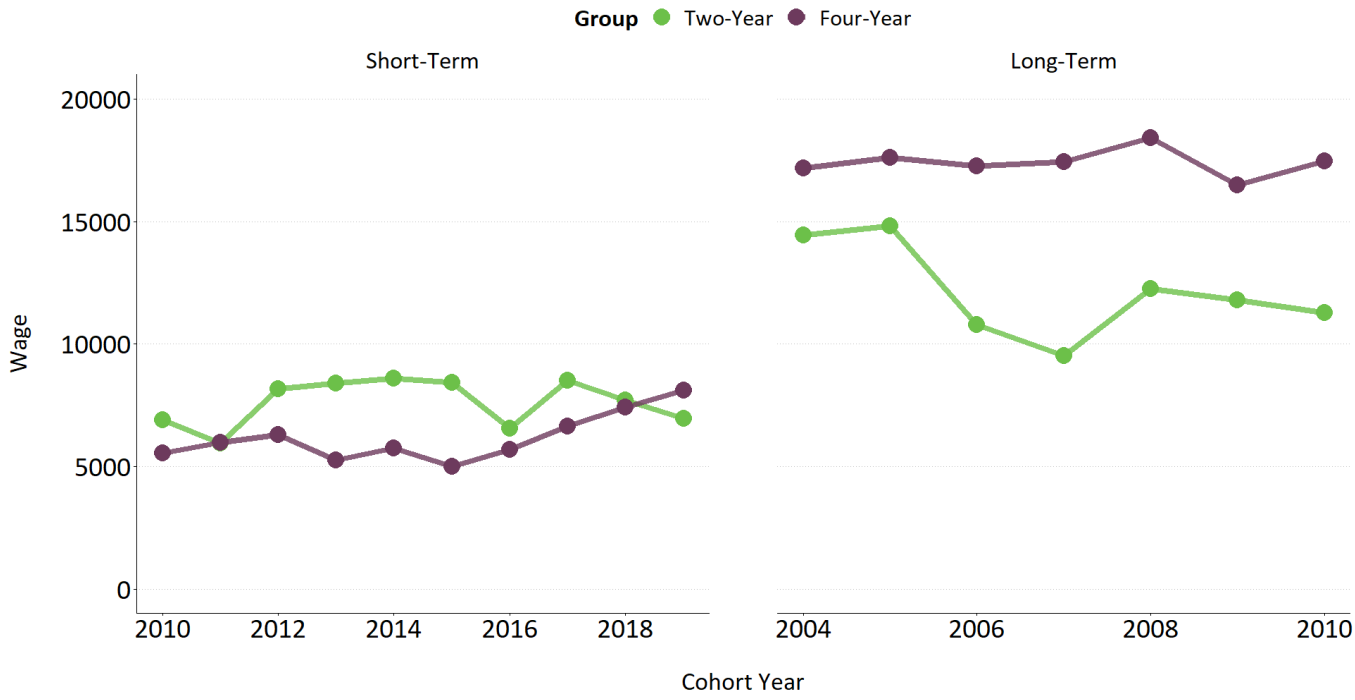
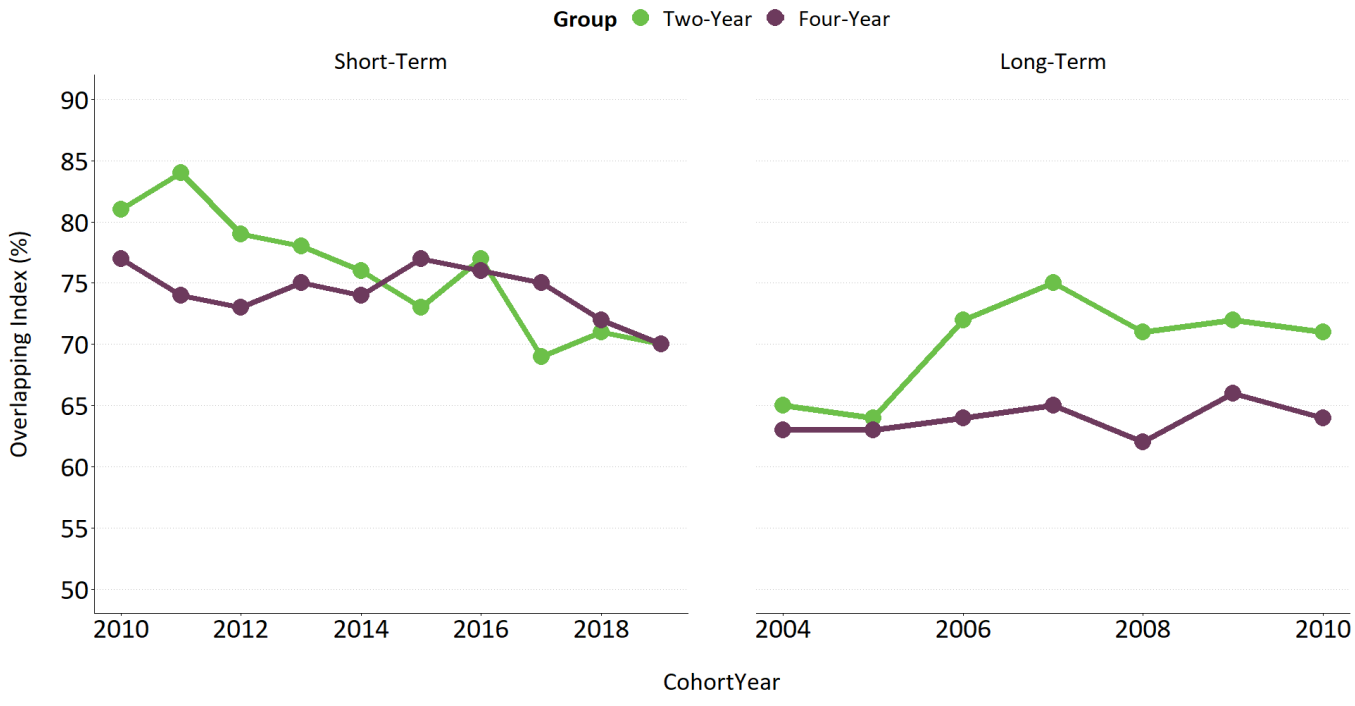


FIGURE 4f: Overlapping Indices of Wage Distribution of Graduates by Gender



Equity in Wage Outcomes: Race and Ethnicity

To assess equity in wage across race and ethnicity, approaches identical to the gender section were taken; the difference in median wage and overlapping index were used to create a more complete picture of equity. The White graduates were considered the baseline and are compared to the groups included in the Department's race/ethnicity metric.

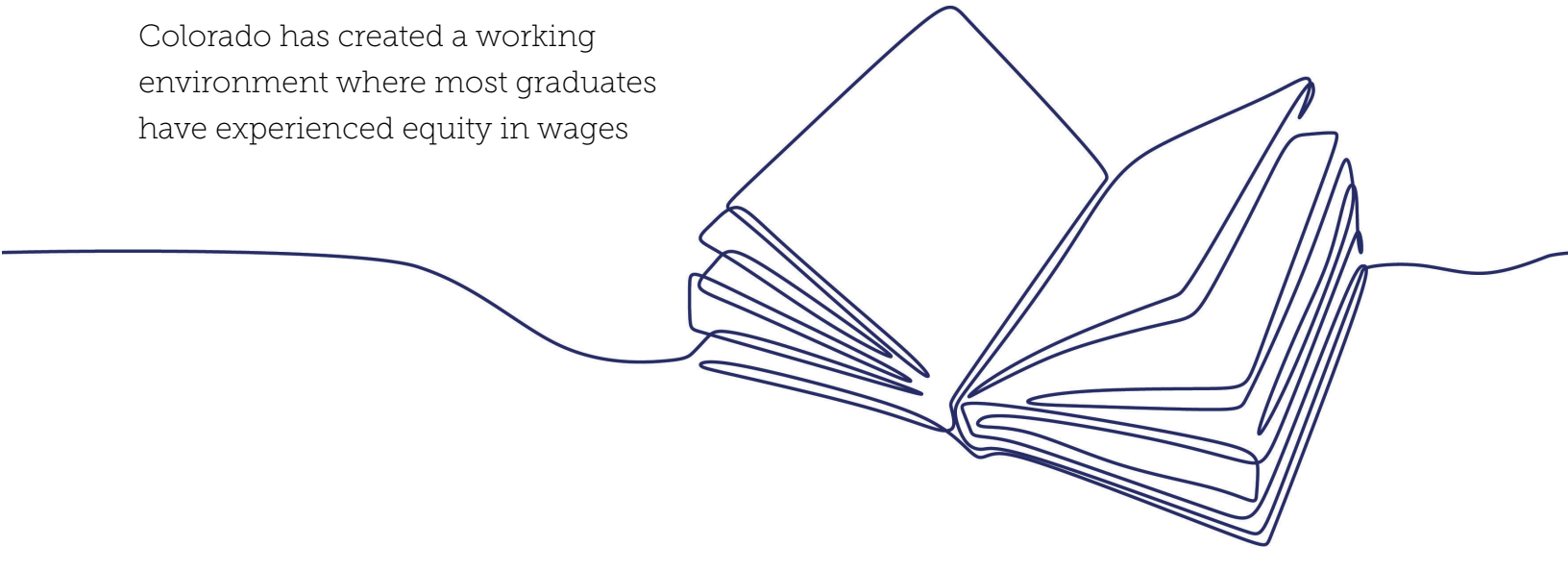
Regarding the group differences from two-year institutions, differences in short-term and long-term wages decreased. Overlapping indices increased during this period (except for the short-term wage of White and Hispanic groups, for whom the indices remained steady).

Results are not as encouraging for graduates from four-year institutions. Only American Indian or Alaska Native groups decreased the difference in short-term median wage, while African American or Blacks have decreased the difference in long-term median wage. When assessing similarities, only the Hispanic (for short-term) and the African American or Black (long-term) wage distributions were analogous to those of the White group.

Although specific details on the differences and similarities between the groups vary, it is important to recognize the overarching theme of equity in wage across gender and ethnicity: Colorado has created a working environment where most graduates have experienced equity in wages. In every cohort year, the overlapping index exceeds 65%. Any median wage differences can be attributed to the non-overlapping minority that occupies less than 35% of the graduate population.

The analyses of equity in wage across gender and ethnicity suggest that over the past 10 years, Colorado has created an equitable working environment for most Coloradans. Furthermore, this improvement is ongoing, which is only possible through enduring collaborations among state government, colleges, businesses, and students. However, there is still a lot of work to do, and a deeper exploration of equity issues is needed to identify and address systemic problems.

Colorado has created a working environment where most graduates have experienced equity in wages



Conclusion

Higher Education Is Worth the Investment to Benefit All Coloradans

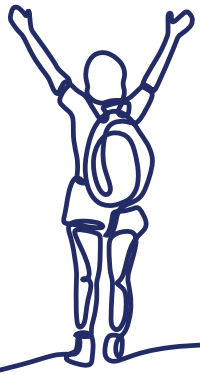
Whether in economic prosperity or recession, Coloradans with higher education credentials are more likely to earn higher wages and occupy higher quality jobs than those with only a high school diploma or lower. This affirmation of the financial benefits and personal gain of higher education complements the public good of higher education.

Programs in institutions of higher education provide Coloradans with different returns. Increasing transparency about wage outcomes at the program level allows Coloradans to make data-informed decisions about their higher education investment.

Coloradans have many options to fund their higher education pathways. While tuition and fees at some institutions are a substantial cost to students and their families, there are pathways to higher education made possible through financial aid, and efficiencies such as Concurrent Enrollment help to constrain costs.

Colorado's workplace wage outcomes are becoming more equitable across gender, race, and ethnicity for Coloradans with higher education credentials.

These results imply that Coloradans can significantly enhance their quality of life by taking advantage of the opportunities the Colorado higher education system provides. This system has been continuously improved through strategic partnerships among the state government, institutions of higher education, businesses, and students to benefit all Coloradans.



Coloradans can significantly enhance their quality of life by taking advantage of the opportunities the Colorado higher education system provides.

Policy Implications

In 2019, Governor Polis, in partnership with CDHE and CCHE, released the Roadmap to Containing Costs and Making College Affordable. The roadmap lays out a bold agenda for Colorado to make higher education more accessible to Coloradans Implementing the strategies in the roadmap will further improve the Colorado higher education system and accelerate generating return by reducing the time and resources Coloradans invest in earning a degree.

- Initiatives to increase FAFSA and CASFA completion rates are an important priority in helping individuals to understand and access the aid that is available to them, increasing college-going.
- Recent investments in financial aid and wraparound support programs that help student success, such as the Colorado Opportunity Scholarship Initiative (COSI), will go a long way in supporting individuals to access and succeed in higher education.
- CDHE's CORE initiative, focusing on transfer standards, and prior learning assessment will support student transitions that are efficient and harness the value of as many credits as possible toward a credential.
- The hiring of CDHE's Chief Educational Equity will drive a targeted agenda around the equity gap in access and completion and support deeper collaboration across agencies to ensure a more equitable society.
- CDHE's work on the social determinants of success highlight the need to have hunger free campuses that ensure healthy minds.
- When entering higher education pathways, Coloradans can actively make data-informed decisions to consider maximizing their financial return. Supporting the increased transparency of data around all credential types is crucial.
- Maximizing the stackability of credentials is an important priority in supporting Coloradans from a variety of backgrounds to complete and benefit from holding a credential of value.

Data and Methodology

To calculate the various metrics outlined in this report, CDHE receives data from several sources, including Colorado public postsecondary institutions of higher education (IHEs) via the department's SURDS (Student Unit Record Data System) and unemployment insurance (UI) wage data from the Colorado Department of Labor and Employment. The sharing of data among IHEs and CDHE, as well as data sharing between CDHE and other state agencies, has allowed CDHE to provide valuable insights into student postsecondary success. Following is a breakdown of several of the metrics outlined in this report and the methods used to calculate those metrics.

Program Groupings: Degree programs were grouped into categories using two-digit CIP codes and the Complete College America Meta Major framework that has been adopted by the Bill and Melinda Gates Foundation, SHEEO, NCHEMS and other foundations. Grouping programs provides higher match rates (by overarching program) and more aggregated counts of students (to address data privacy concerns).

Cost Data: To allow for national comparisons, state-level published tuition and fees estimates were taken from the College Board's Trends in College Pricing report. These data are closely aligned with the numbers reported in the department's annual Tuition and Fees report. Institutional and program data on tuition and fees in this report come from the CDHE Tuition and Fees report. Estimates for housing, food, books and other expenses used to calculate cost of attendance are from the CCHE's approved student budget parameters. Finally, average financial aid data is derived from data reported on the Financial Aid portion of the Integrated Postsecondary Data System (IPEDS).

Debt: State- and institutional-level debt was calculated using the 2017-18 SURDS Financial Aid file. It includes students who completed a degree at a Colorado institution of higher education and were classified as resident students at the time of graduation. For graduates of four-year institutions, it includes debt that they incurred up to six years before graduation; for graduates of two-year institutions, it includes debt that was incurred up to three years before graduation.

Time to Credential and Credits at Credential: *Time to credential* was calculated using completion data from the 2017-18 SURDS Degree file. Of those who completed a degree at a Colorado public institution of higher education (IHE), the student's first-time enrollment at that same Colorado IHE was found. Additionally, a student's first-time enrollment was matched to the type of credential the student was seeking. For example, if a student received a bachelor's degree, the student's first-time, bachelor's-degree-seeking status entry was used. Based on these data, a time to credential (in years) was calculated. Calculations for associate degrees and certificates used a similar method. Students receiving a credential via the state's Reverse Transfer process were removed from the calculations. *Credits at credential* data was calculated using the maximum cumulative credits hours accumulated by a student at the time of their credential completion.

Median Earnings: CDHE's work over several years to link credential completion and UI wage data has resulted in the ability to provide valuable insights into actual wage outcomes for students who complete and credential in Colorado and stay in Colorado after graduation to work. Median one-, five- and 10-year earnings data were calculated, matching degree completion and UI wage data. A detailed methodology for these calculations as well as median wage outcomes by IHE, program grouping (2-digit CIP) and program (4-digit CIP) can be found via CDHE's Postsecondary Degree Earnings Outcomes Tool.

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