



UNIVERSITY *of*  
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COLORADO EVALUATION  
AND ACTION LAB

# Colorado's Early Care and Education Professionals

## 2019 Snapshot Report

### Report Highlights:

Colorado needs to expand its commitment to infant and toddler care in order to meet the demands of children and families.

Colorado needs effective strategies for ECE professional recruitment, retention, and professional development in order to spend its early childhood investments effectively.

Colorado needs to invest in data systems and smart use of these data to be responsive to changing conditions of the ECE professional workforce.

An interactive, web-based data dashboard will launch summer 2020 with access to county-level data from this report and more.

### Whitney LeBoeuf, PhD

Director of Data Integration and Analytics  
Colorado Evaluation and Action Lab

### Phil Perrin, MA

Colorado Evaluation and Action Lab Consultant  
Phil Perrin Consulting, LLC

### Stacey Kennedy, MPA

Director of Child Care Quality Initiatives  
Office of Early Childhood – Colorado Department of Human Services





## Abstract

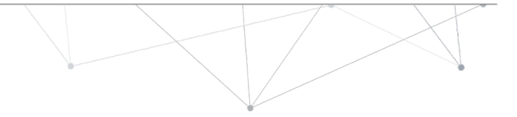
A qualified and dedicated early care and education (ECE) professional workforce is essential for the well-being of our youngest children. Despite the importance of ECE professionals, the field continues to experience challenges recruiting and retaining individuals in the workforce, often due to high expectations for early care with inadequate compensation. The rise in attention to early childhood programs and policies in Colorado has demanded information on the ECE population including its size, educational and professional characteristics, and stability and turnover to guide public investments.

This study was designed to meet this escalating need for actionable information among decisionmakers. Using the capacity of the Linked Information Network of Colorado (LINC), this study pulled together disparate data assets in the Colorado Department of Human Services (CDHS), Office of Early Childhood and created *the first comprehensive dataset* on ECE professionals in Colorado. These data were used to create a web-based interactive data dashboard as well as this snapshot report. This report does not reflect the priorities of CDHS for allocating funding or other resources. Any CDHS requests for funding or statutory changes will be developed in collaboration with the governor's office and communicated to the legislature through the regular budget and legislative processes.

There were several findings from this study that directly addressed information needs of Colorado government leaders, policymakers, and community stakeholders. First, this study found that teachers serving children ages 3-5 years outnumbered infant and toddler teachers by a ratio of 2 to 1, confirming that an insufficient supply of infant and toddler care continued to plague families in Colorado. Findings also showed lower educational attainment among infant and toddler teachers, and that Hispanic ECE professionals were completing college and entering leadership positions at lower rates than their White colleagues. These findings suggest continued barriers to completing postsecondary pathways for qualification among key subgroups of the ECE professional population, and work is needed to address these barriers and to understand how individuals are utilizing other professional pathways for qualification. Lastly, this study demonstrated a high level of turnover in the ECE field, with almost one-third of professionals changing jobs in 2019. The field also experienced the highest number of new entrants in rural counties, suggesting that efforts to expand ECE opportunities in rural areas were working.

This study gave an unprecedented view into the ECE professional population and was a significant step toward a data-informed approach to investments in the workforce. While this study developed valuable data assets, it also highlighted remaining data gaps that can be filled through future research, including postsecondary program enrollment and persistence, compensation, participation in public assistance programs, and impacts of COVID-19 on ECE professionals. This smart use of data will continue to deepen our understanding of the ECE professionals and will allow Colorado to track whether strategies designed to improve conditions of the workforce are successful.





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- Carin Rosa, Director, Child Care Licensing, Office of Early Childhood (OEC)-Colorado Department of Human Services (CDHS)
- Erin Mewhinney, Director, Early Care and Learning, OEC
- Jennifer O'Brien, Director, Early Childhood Workforce Development-Colorado Department of Education
- Heather Craighow, Director, Head Start Collaboration Office, OEC
- Renee Alarcon, Professional Development Information System Administrator, OEC
- Angela Ben-Zekry, Early Childhood Workforce Manager, OEC
- Brian Conly, Former Deputy Director, OEC

The data team in the Child Care Licensing Background Investigation Unit in CDHS provided subject matter expertise, data support, and assurance that the data were handled with utmost care and confidentiality. This report does not reflect the priorities of the CDHS for allocating funding or other resources. Any CDHS requests for funding or statutory changes will be developed in collaboration with the governor's office and communicated to the legislature through the regular budget and legislative processes.

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## Data Sources

1. The Professional Development Information System: OEC
2. Background Information Unit, Division of Child Care Licensing: OEC
3. Quality Rating and Improvement System data on licensed providers: OEC

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## Introduction

The earliest years in a child's life establish the foundational skills upon which future development and well-being are built. Research showing the importance of early cognitive, social-emotional, and physical development has led to unprecedented investments in policies and programs designed to nurture the well-being of young children nationwide.<sup>1,2</sup> The last two decades have brought the national spotlight to early childhood, making its way into major political campaigns and presidential debates. Colorado is no different, with Governor Polis making full-day kindergarten and universal pre-K a primary 2018 campaign promise and priority once in office.<sup>3</sup>

While the nature of these early childhood policies and programs may vary, there is an important ingredient regardless of the program: prepared educators with high-quality teacher-child interactions.<sup>4</sup> The training and professional development of early care and education (ECE) professionals (those serving children ages 0-5 years) can significantly impact the quality of an early childhood program and the overall well-being of children.<sup>5,6</sup> Retention of high-quality ECE professionals is a struggle, and research has shown that high teacher turnover can significantly influence student engagement and academic performance.<sup>7</sup> Factors like unlivable wages are outweighing the incentives for staying in the field.

**There is an important ingredient regardless of the program: prepared educators with high-quality teacher-child interactions.**

With growing momentum to drastically expand early childhood programs and implement universal pre-K, Colorado has recognized that the success of these investments is vulnerable without a supported ECE professional workforce. In 2017, *Transforming the Early Childhood Workforce in Colorado* was launched as a public-private partnership to understand the conditions of the ECE professional workforce and drive toward innovative solutions to better support them.<sup>8</sup> *Colorado's Early Childhood Workforce 2020 Plan* that came out of this work identified six research-informed areas requiring transformation to meaningfully improve the early childhood workforce: workforce development, recruitment and retention, compensation, leadership, finance, and data and continuous improvement.<sup>9</sup>

### Research from ECE Professional surveys and market data that informed the Early Childhood Workforce 2020 Plan:

- Most surveyed ECE Directors and Lead Teachers held a bachelor's degree but few had early childhood specialization.<sup>10</sup>
- Center-based Directors reported turnover rates among staff ranging from 16% to 22% among the various ECE professional roles, and 70% reported significant challenges filling the gaps left behind.<sup>11</sup>
- In 2018, ECE teachers in Colorado earned less than half the salary of kindergarten teachers.<sup>12</sup> One in three reported receiving subsidies from public assistance programs to make ends meet.<sup>13</sup>



### Research from ECE Professional surveys and market data that informed the Early Childhood Workforce 2020 Plan:

- ECE revenue sources were insufficient to meet the cost of high-quality care despite low wages for ECE professionals. This disincentivizes programs from offering higher-cost infant and toddler care.<sup>14</sup>

Since the release of the *Early Childhood Workforce 2020 Plan*, there have been several statewide efforts to address the conditions of the ECE professional workforce. For example, Colorado's Early Childhood Leadership Commission (ECLC) put forth three opportunity areas for the governor to consider early in his administration, one being to "elevate the early childhood workforce to ensure coordinated career pathways and appropriate compensation."<sup>15</sup> The Colorado Department of Human Services Office of Early Childhood (OEC) was awarded the *Colorado Shines Brighter - Preschool Development Grant* (PDG) from the federal government that included several commitments to improve opportunities for the ECE workforce.<sup>16</sup> And State Senate Bill 19-063 was passed during the 2019 legislative session requiring ECLC and the Colorado Department of Human Services (CDHS) to put together an *Infant and Family Child Care Action Plan* to address the shortage of infant and toddler child care providers in Colorado.<sup>17</sup> These efforts have successfully brought widespread attention to the value of a high-quality ECE workforce to ensure that early childhood investments are well spent and sustainable.

With this focus on ECE professionals comes a thirst for reliable data on the current state of the workforce. Policymakers, investors, and program leaders are asking: How many ECE professionals are working right now? How many are serving infants and toddlers versus preschoolers? What are the educational pathways for different ECE professional roles? What is the growth and turnover among ECE professionals as we consider addressing shortages? The answers to these questions require statewide data on the ECE professional workforce.

**With this focus on ECE professionals comes a thirst for reliable data on the current state of the workforce.**

Presently, there is no singular data system that collects information on all ECE professionals. In some cases, the data systems that do gather pieces of critical information are siloed in separate government organizations. In other cases, the same government entity holds the critical data, but they live in separate data systems that are not equipped to connect seamlessly to one another. Where these data do exist, the quality has not been assessed for answering high priority questions, and the value of these data assets has heretofore remained unknown.

This need for comprehensive, quality data on the ECE workforce to inform high-priority policy and program decisions was the driving motivation for the current study. The need for routinely refreshed data on the ECE workforce has only grown in the face of COVID-19. Previous data on the ECE workforce has relied on direct surveys to professionals, which is advantageous for gleaning information otherwise unavailable in administrative records. However, the response rates on surveys have been low, and surveys are unable to ascertain hard and fast numbers around the size and growth of the total ECE population. Therefore, this study strove to address this information gap by creating a sustainable data asset on the ECE professional workforce for Colorado.



## Description of the Study

This study had three primary goals. The first was to examine the data systems administered by OEC and to combine the relevant data assets from these systems to create *the first comprehensive set of data* on ECE professionals in Colorado. The second goal was to produce de-identified, publicly-available data on the ECE workforce in the form of an interactive data dashboard to answer high-priority questions being asked by policy and program leaders as well as stakeholders in the community. The data dashboard will be hosted by OEC beginning summer 2020 and is expected to be updated at regular intervals by the OEC team using the methodology produced through this study. The final goal of the study was to complete this snapshot report on the ECE workforce that highlights key findings from the data. The primary questions addressed in this snapshot report include:

**Who are the ECE professionals serving Colorado’s young children?**

**What are the education and professional profiles of ECE professionals?**

**How much growth, persistence, and turnover occurs in the ECE professional field?**

A set of inclusion criteria were applied to the linked data to determine who was actively working in the ECE professional field during the 2019 calendar year. Descriptive analytics and geographic mapping tools were then used to provide an overview of the size, demographics, and geographic distribution of the ECE professional population. Educational attainment and early childhood (EC) professional credentials were analyzed as well as variation in employment by ECE provider quality rating. These findings were explored overall as well as by ECE professional role, race/ethnicity, and geographic region. Analysis of the growth, persistence, and turnover in the ECE professional field was possible due to the background check records housed in the OEC’s Background Investigation Unit (BIU). These records were transformed into measures of growth (new entrants to the field in 2019), persistence (working in the ECE professional field for three or more years), and turnover (changing jobs in the last one and three years). Metrics of stability and change in the ECE field were analyzed overall, by professional role and by geographic region.

## Key Findings

**Finding 1: There were over 23,000 ECE professionals in Colorado in 2019 and most were serving 3- to 5-year-olds.**

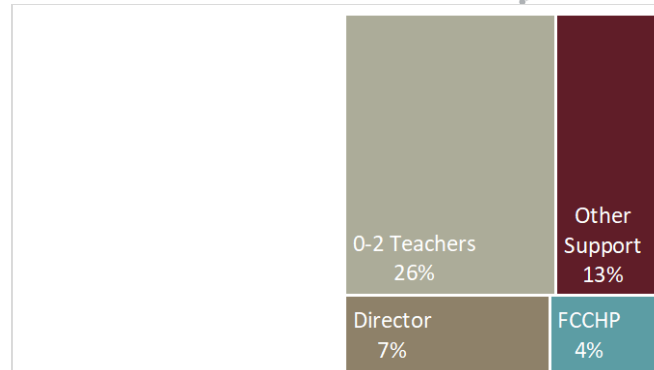
**Public and private center-based teachers serving kids ages 3-5 years outnumbered infant and toddler teachers 2-to-1 in 2019. The desired split should be nearly equal.**

The findings from this study are consistent with those from the recent early childhood needs assessment report, *Colorado Shines Brighter*, in that the greatest shortage in licensed care is for infants and toddlers.<sup>18</sup> This report indicated that the current state of licensed child care is meeting 89% of the preschool care needs but only 53% of the infant and toddler child care needs.



In the desired state of licensed care, we would expect the majority (53%) of the ECE teaching workforce to serve infants and toddlers and 47% to be serving 3- to 5-year-olds when considering the allowable teacher-child ratios for infants, toddlers, and preschoolers.<sup>19</sup> However, infant and toddler teachers comprised *only one-third* of the teaching workforce in the current study. Even if the entire set of Family Child Care Home Providers (FCCHP) in this study were doubled

to account for underrepresentation and were assumed to *all* be serving infants and toddlers, the percentage of infant and toddler teachers would rise to only 40% of the ECE teaching workforce. While the entire field of ECE professionals needs to grow in order to meet the demands of Colorado, this is particularly true for those serving children under three years of age.



## Finding 2: There were ethnic inequities in educational attainment and ECE leadership roles.

**Hispanic ECE professionals were less commonly filling Lead Teacher or Director roles in the field compared to White professionals.**

This study revealed that 40% of Hispanic ECE professionals were employed as Lead Teachers or Directors compared to 52% of White ECE professionals. The proportion of White ECE professionals serving in Director positions was twice as high as the proportion of Hispanic ECE professionals (10% versus 5%). This remained relatively unchanged from the most recent snapshot of ECE professionals in 2017 that showed similar inequities in leadership positions for Hispanic ECE professionals.<sup>20</sup> A contributing factor to the disparity in leadership roles may be the stark imbalance in educational attainment between Hispanic and White ECE professionals. Two White ECE professionals were obtaining a college degree for every one Hispanic ECE professional, and Hispanic professionals had the largest proportion of individuals (32%) who had a high school degree but did not have some college experience.

It is important to note that there are many professional pathways for career development in order to become qualified for higher levels of leadership in the ECE field. Unfortunately, those data have not yet been centralized in the state and could not be examined as part of this study. Had the data on those professional pathways been available, this study would have been able to tell a more comprehensive story of professional growth in the ECE field.

## Finding 3: Rural and frontier counties had the largest ECE field growth rates.

**Growth rates in rural counties (14%) doubled that in urban counties (7%). Frontier counties were recruiting ECE professionals even more rapidly, with an average growth rate of 18%.**

The high levels of growth in the state spanned larger rural counties (e.g., Pitkin, La Plata, and Montrose) as well as smaller frontier counties (e.g., Prowers, Otero, and Washington). Colorado has recognized the additional challenges that rural and frontier areas face in standing up center-based care for their





youngest children, and the Governor’s leadership team has been working to identify creative solutions for how these communities can address the child care and education needs of their residents. Therefore, it is heartening to see that rural and frontier counties were outpacing urban epicenters in their growth of new ECE professionals over the course of 2019.

### **Finding 4: Job turnover among ECE professionals continued to pose a challenge for providers and families, particularly those with infant or toddler care.**

**More than 1 in 4 ECE professionals changed jobs within the field at some point during 2019, and half of those continuously working had made a job change at some point in the last three years.**

The rates of turnover were higher than previous findings from the *Transforming the Workforce* research from 2017, indicating a possible increase in turnover in the last few years.<sup>21</sup> While it is reasonable to assume that a portion of these job changes were likely related to positive growth for individuals, the downside is that all ECE professional turnover results in instability and churn for providers and families. This is especially true in the ECE field, as ECE professionals develop a bond with the children in their care, and those children need to rebuild their caregiver relationship with each instance of turnover.

Moves that don’t align with promotion are worth examining. Sixty percent of infant and toddler assistant teachers who had been in the field for three or more years and had made at least one job change during that time. These 410 individuals were demonstrating lateral moves rather than advancement in their professional role, despite having been in the field for an extended period. There is a need to understand the reasoning behind lateral moves in order to inform strategies that nurture desired job promotion and decrease unnecessary moves.



of ECE professionals changed jobs in the last 3 years

## **Implications**

### **Implication 1: Colorado needs to expand its commitment to infant and toddler care in order to meet the demands of children and families.**

The findings from this study emphasize what is already known in Colorado and nationwide: We are drastically underserving families needing quality infant and toddler care. Colorado has experienced dwindling availability of licensed infant care over the last decade, forcing families to join growing waitlists at the remaining center- and home-based providers where infant enrollment is maxed out.<sup>22</sup> OEC and ECLC recently developed a strategic action plan for addressing the infant and toddler care shortage in response to SB19-063. This strategic action plan recommended several solutions, such as making it more feasible for prospective infant and toddler providers to navigate licensing regulations and increasing the capacity and resources of the state’s child care licensing process.<sup>23</sup>



In alignment with these recommendations, OEC is planning to offer scholarships for individuals to obtain a Child Development Associate Credential designed to increase the infant and toddler workforce. OEC also plans to offer the Expanding Quality in Infant and Toddler Care coursework and coaching to support personnel qualifications and quality practice. These activities will be supported with funding from the Colorado Shines Brighter - PDG award.<sup>24</sup>

The intense focus on universal pre-K (4- to 5-year-olds) may also have the unintended consequence of detracting attention and potential funding support for the supply of licensed infant and toddler care (and therefore the workforce). As a field, we often lump together “birth to 5” as a singular population, and resources or growth in support for a portion of the population is seen as a success for all. This is not to suggest we reduce current attention on investments in pre-K, because this is still a population being underserved. However, without directly connecting support for infant and toddler care to these pre-K investments, these two parts of ECE sector remain pitted against one another in budgets.

**Other states have modeled promising strategies that allow the infant and toddler ECE workforce to “ride the wave” of the pre-K momentum.**

Other states have modeled promising strategies that allow the infant and toddler ECE workforce to “ride the wave” of the pre-K momentum in order to begin reducing the large gaps in demand and supply. For example, Illinois enacted Early Childhood Block Grants (ECBG) as part of the School Code in 2017.<sup>25</sup> This allowed for early childhood programs across the state to apply for funding from the state, with 80% of the funding going to preschool programs and 20% going to programs serving infants and toddlers, including community-based partnerships. There is a major advantage of combining early childhood funding—as preschool funding increases, so does infant and toddler care funding. In fact, the committed funding for the ECBG increased 60% (from \$394 million to \$594 million) in the last four years, meaning that the funding for infants and toddlers grew by \$45 million during that time.<sup>26</sup> This doesn’t prevent more support for infant and toddler care beyond the ECBG, but it at least ensures a proportional increase in infant and toddler funds relative to preschool.

Beyond public funding, Colorado needs *a workforce that supports its ECE workforce*. There have been numerous strategies across the country to blend and braid public funding sources to maximize the value of investments in early childhood programs. However, the bottom line consistently shows there are simply not enough resources to sustain a sizeable qualified ECE workforce.

Private industries have an opportunity to explore strategies like investing in on-site child care for staff, cafeteria plans that provide subsidies for child care tuition, and matching dependent tax credits for employees with young children.

Investing in an ECE workforce gives private businesses a better chance of retaining their *own* valuable employees, a strategy worth of serious consideration.

**Colorado needs a workforce that supports its ECE workforce.**



## Implication 2: Colorado needs effective strategies for ECE professional recruitment, retention, and professional development in order to spend its early childhood investments effectively.

The study findings of leadership role disparities, high turnover, and job stagnation among many infant and toddler assistant teachers signal the need to widen the field's approaches to recruiting, retaining, and promoting job growth among ECE professionals. An economic analysis of ECE in Colorado estimated that reducing a provider's turnover rate by 10% can save the provider approximately \$6,500 annually.<sup>27</sup> This means that, if the state were able to reduce the overall ECE professional turnover rate from 28% to 18%, the cost savings to the 2,067 center-based providers in the state would total nearly \$13.5 million per year.

Colorado took several timely action steps in 2019 to ease the financial burden carried by much of the ECE professional workforce and to incentivize retention, including:

- A state budget that included \$4.9 million in postsecondary scholarships to individuals pursuing college degrees with specialization in early childhood to incentivize degree completion.<sup>28</sup>
- The passing of State House Bill 19-1005, *Income Tax Credit for Early Childhood Educators*, that provides income relief for individuals working in the ECE field.<sup>29</sup>
- Investing in improving the state's Learning Management System to make ECE professional development opportunities more accessible, and a commitment to better align competencies, qualifications, and credentials with requirements.

**The existing turnover will be compounded as we continue to battle the COVID-19 crisis.**

It is critical to consider that the existing turnover will be compounded as we continue to battle the COVID-19 crisis. In fact, the above-mentioned budget inclusions and tax credits may be at risk in the 2020 legislative session due to drastic budget cuts. The pandemic has undoubtedly impacted the ECE professional workforce, their job stability, and their outlook for continued employment in the field. In response, OEC and partners took quick action with economic relief funds through the federal CARES Act. OEC offered emergency child care for essential workers and expanded payments for lost enrollment dollars to support the viability of providers during the pandemic. The state continues to develop short- and long-term strategies to mitigate the economic effects of COVID-19 on the early childhood sector as well as the health and safety of ECE professionals and the children they serve.

A missing piece to the professional development picture in this study was the professional pathways that many ECE workforce members take to become qualified for job promotion and higher leadership positions. These pathways offer multiple options for individuals to meet the qualifications for Assistant Teacher, Lead Teacher, and Director roles. OEC has developed these pathways recognizing that the postsecondary and newer EC professional credential routes are not the best fits for many ECE professionals.

Nonetheless, this study identified some promising engagement opportunities to combat racial and ethnic inequities. Hispanic and Black ECE professionals were engaging in the EC professional credentialing process at similar rates to their White colleagues, and there may be opportunities to leverage this engagement to nurture eligibility for leadership roles. And over a third of Hispanic ECE



professionals indicated that they had pursued a postsecondary educational opportunity at some point, though details were not specified in the data systems supplying information for this study.

Greater insight around their college experiences, the degrees being pursued, and persistence in those educational programs may provide helpful insights. For example, did these ECE professionals choose to put a hold on their postsecondary degree when they found an alternative professional qualification pathway that better met their needs? Were their postsecondary pursuits paused for unwanted reasons? Targeting the state’s proposed postsecondary scholarship funds toward the population of ECE professionals who were forced to put their college plans on hold can help individuals cross the finish line and improve their eligibility for job promotion.

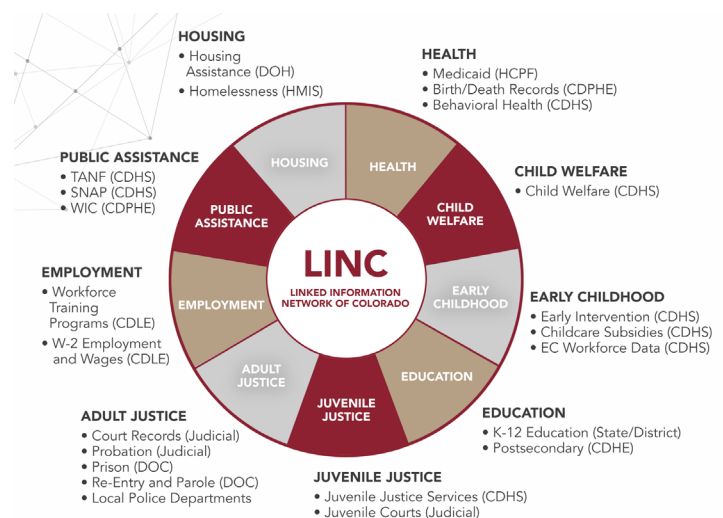
**Targeting the state’s proposed postsecondary scholarship funds...can help individuals cross the finish line and improve their eligibility for job promotion.**

Lastly, the accelerated growth in new ECE professionals in rural and frontier counties needs to be more deeply examined to learn which strategies have been effective and how to continue modeling those strategies during the COVID-19 crisis. It is essential to find ways to sustain and build upon the growing momentum that was demonstrated in 2019. Some of these strategies may shine light on innovative approaches to support smaller center-based providers or FCCHP during the rocky economic conditions of the pandemic.

**Implication 3: Colorado needs to invest in data systems and smart use of these data to be responsive to changing conditions of the ECE professional workforce.**

The timing of this study was critical, as this report and the related interactive data dashboard offer baseline information on the ECE professional workforce prior to the impact of the COVID-19 crisis. These two sources provide the foundational information about the field prior to the pandemic, and the expected refreshes on these data over time will allow for the study of how deeply COVID-19 is impacting the well-being of ECE professionals in terms of recruitment, retention, and turnover. Without the investment in this project, the state would not have had a reliable source of information to inform highly consequential decisions about where to invest precious resources in the ECE workforce and the effectiveness of these investments through the pandemic.

In addition to continually updating the interactive data dashboard, the next phase of this work will address several of the data limitations of the current project in order to expand our understanding of the ECE professional workforce. The PDG award included support for connecting the data from the current study to other relevant data sources on the ECE workforce using the capacity of the Linked Information Network of Colorado (LINC).<sup>30</sup> LINC is a data collaborative among Colorado state, local,





and non-profit organizations that centralizes the capacity to integrate and produce anonymized data that can be analyzed to answer high-priority policy questions while protecting the privacy of Colorado residents. Based out of the Governor's Office of Information Technology and supported by the Colorado Evaluation and Action Lab, LINC offers a unique opportunity to examine otherwise hidden issues of the ECE workforce. For example, cross-system data from LINC data partners could allow an examination of:

- Labor and employment data on wages, multiple jobs, job loss, and reliance on unemployment benefits during the COVID-19 crisis (Colorado Department of Labor and Employment);
- Postsecondary enrollment and degree pathways of ECE professionals and factors affecting whether these professionals graduate (Colorado Department of Higher Education); and
- Participation in public assistance programs and changes in eligibility and enrollment during the pandemic (CDHS).

OEC is also building a more comprehensive workforce data system to support professionals. The findings from the current study and a quality analysis of the current data systems will provide essential input for ways this data system can be improved. Some of the learnings from this study included:

- A need to grow participation in the workforce data system, particularly among FCCHP in the state. This may require mandatory participation among ECE professionals in licensed care settings.
- Routine prompts for ECE professionals to update their information in the data system and a way to capture changes in professional roles, employers, and educational attainment.
- A connection between the background check system and the workforce data system that will allow efficiencies in the child care licensing process as well as critical information tracking on when turnover is occurring and why.
- Reaffirming OEC's goals to centralize information on the professional pathways for earning qualifications for job promotion in the ECE field in order to have a comprehensive picture of education and career pathways. Presently, only Director qualifications, self-reported educational attainment, and the EC professional credential are centralized.

These commitments to improved data systems, data sharing, and *use* of the resulting data have endless value for tracking the successes of current investments and targeting future resources effectively.

## Methods

At the beginning of the study, the research team built a project team as well as general advisors who helped shape the focus of the project and provided feedback on the data sources and methodology used to meet the project goals. These stakeholders represented the following organizations:

- Child Care Quality Initiatives and Child Care Licensing, OEC (Project Team)
- Early Childhood Workforce Development-Educator Talent, Colorado Department of Education (Project Team)
- Data Subcommittee, ECLC (Advisors)
- Early Childhood Professional Development Advisory Group, ECLC (Advisors)



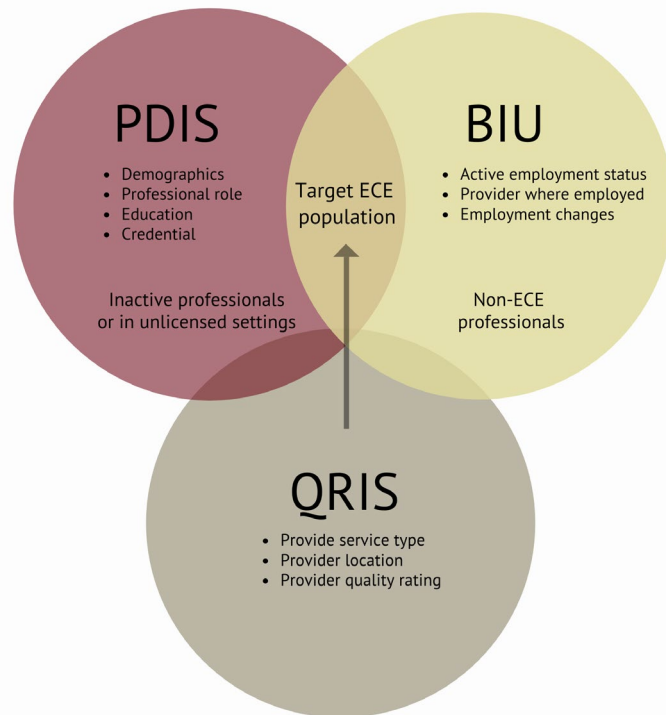


## Landscape analysis of early childhood workforce data systems

The research team worked with the stakeholders to conduct a landscape analysis of which OEC statewide data sources maintained critical data assets to accomplish the following goals:

- Build a comprehensive picture of Colorado ECE professionals who serve young children.
- Refresh this comprehensive picture of ECE professionals annually at minimum.

Because the research team was approved to access only OEC data sources for this study, and these data systems collect administrative records related to the specific business needs of OEC, there were notable gaps in the data assets available to achieve the goals of the study. These gaps were described in the implication section of this report along with future phases of work that will strive to fill these data gaps for Colorado ECE professionals. Through the landscape analysis, the research team identified the following three OEC data sources to accomplish the study goals.



### Colorado Shines Professional Development Information System

The Colorado Shines Professional Development Information System (PDIS) is a web-based portal that was launched in 2015 to support the ECE workforce by tracking education, credentialing, and professional development experiences.<sup>31</sup> PDIS users are able to take courses that promote their progress in the field, and users are able to share course credits and credentialing information with their employers via a downloadable certificate. Some required coursework for the ECE workforce, including Sudden Infant Death Syndrome (SIDS) prevention training and prevention of abusive head trauma training, are available and widely utilized by ECE professionals serving children ages 0-3 years. Anyone can create a PDIS user profile (including demographics, professional role, educational attainment). The only users required to create a profile are those ECE professionals working for a provider that is progressing to one of the higher rating levels in the state's Colorado Shines Quality Rating and Improvement System (QRIS). Some data elements in the PDIS are verified by OEC staff members, but the majority is self-reported and updated at will.

The PDIS was essential for this study because it provided the most comprehensive set of individual-level information on ECE professionals in Colorado, including demographics, professional role, education level, attainment of an EC professional credential, and coursework completion. PDIS data from 2017 to 2019 were used in this study.



## Background Investigation Unit Data

The Background Investigation Unit (BIU) is based in the Division of Early Care and Learning at OEC and performs child abuse and neglect and criminal background checks on every ECE professional applying to work in a licensed child care provider facility in Colorado. Criminal background checks query the Colorado Bureau of Investigation (CBI) and the Federal Bureau of Investigation (FBI) to determine if the applicant has been convicted of any criminal offenses that are identified in the Colorado Child Care Licensing Act. A new background check is required every time a prospective ECE professional is being considered for hire at a new provider. The provider is responsible for submitting the background check request to the BIU.

The background check data were invaluable for this study because they contain the most reliable information on where ECE professionals were working at any given point in time. Relevant data included: dates of background check request, dates and results of CBI and FBI criminal background checks, the name and license information for the provider requesting the background check, and removal dates indicating when the provider submitted information indicating that the ECE professional was no longer employed at their facility. BIU data from 2005 to 2019 were used in this study.

**The background check data...contain the most reliable information on where ECE professionals were working at any given point in time.**

## Colorado Shines Quality Rating and Improvement System

The Colorado Shines Quality Rating and Improvement System (QRIS) data system was launched in 2015 and maintains provider-level information on all licensed child care providers in Colorado, including child care centers, preschool programs, and home-based providers.<sup>32</sup> The QRIS tracks licensing information on providers at the time of initial licensing award as well as annual renewals, including the location of the provider, the provider service type (centers, preschools, home-based), and the most recent quality rating level (updated at minimum every three years). OEC staff supply monthly QRIS datasets on all licensed child care providers to the Colorado Information Marketplace (CIM), a portal to access publicly-available data in Colorado.

**The QRIS data were critical for this study because they included provider information not available in the PDIS or BIU data.**

The QRIS data were critical for this study because they included provider information not available in the PDIS or BIU data. The monthly public QRIS datasets were available through May 2019 on CIM and were used for this study. In order to have a complete picture of licensed care providers through December of 2019, a final QRIS snapshot dataset was produced for the study in early 2020.

## Data Integration and Anonymization

The identity resolution process to link the data from PDIS and BIU was a multifaceted process performed by the LINC staff. The first part involved cleaning and preparing each set of personal identifiers required for record linkage. For example, first, middle, and last names were standardized, generational suffixes were extracted, and birth dates and gender were put into a common format. The end result was a cleaned set of identifiers ready for deduplication and matching.



The identity resolution software, Senzing, was run on the set of identifiers in each dataset to deduplicate individuals to a single set of unique individuals.<sup>33</sup> Because multiple records for an individual might exist with slight variations (e.g., use of nickname instead of first name) or errors, the deduplication process recognized these slight differences and the records were consolidated into a set of unique individuals. The initial dataset of approximately 85,000 PDIS records was reduced to 68,007 unique PDIS users, indicating that approximately 17,000 records in PDIS were duplicates. The initial dataset of approximately 300,000 BIU records was reduced to approximately 180,000 records, indicating that about 120,000 records represented additional background checks that were processed for professionals seeking employment.

#### The Linked Information Network of Colorado (LINC)<sup>34</sup>

The data integration and anonymization work for this study was accomplished by the Linked Information Network of Colorado (LINC) on OEC premises. LINC is a collaborative among data owners in Colorado that relies upon a linking hub in the Governor's Office of Information Technology. LINC is available on a fee-for-service basis to link and anonymize data approved by the data owners for research and analytics.

The LINC Data Scientist performing the functions of the linking hub has technical expertise in identity resolution and has met all certification and background check requirements that permit the handling of identified criminal justice and protected health records.

The Senzing software was then used to match individuals in one dataset to those in the other using a probabilistic algorithm. Subsequent to the use of Senzing, a set of additional rules were created to improve the matching results for those who were not previously matched. These rules acknowledged that there may be errors in some of the identifier fields required for matching and allowed increased leniency in the matching process (e.g., matching first name, last name, and only month and day of birth but not year; or full date of birth but only last name and not first name). With these iterative rules-based searches, matched individuals increased by about 25%.

Once matched, the PDIS profile, history of coursework, and early childhood professional credential data were added to the analytic file. BIU data were used to discern each new provider for whom the PDIS user worked at any given time. These BIU data were transformed into key variables for analytic study, including when professionals entered the job market, who had left their employment at a particular provider, and who had stayed. The QRIS data and BIU records were then matched based on the provider license number in order to attach characteristics of the providers where professionals worked including provider service type, quality rating level, and county-level location. Once the full analytic file was



complete, unique keys were created and then the identifiers were deleted from the file before being provided to the research team for analysis. These anonymized linked data now represent the most comprehensive dataset on the ECE professional workforce in Colorado.

**These anonymized linked data now represent the most comprehensive dataset on the ECE professional workforce in Colorado.**

### **Inclusion Criteria for ECE Professionals in Study**

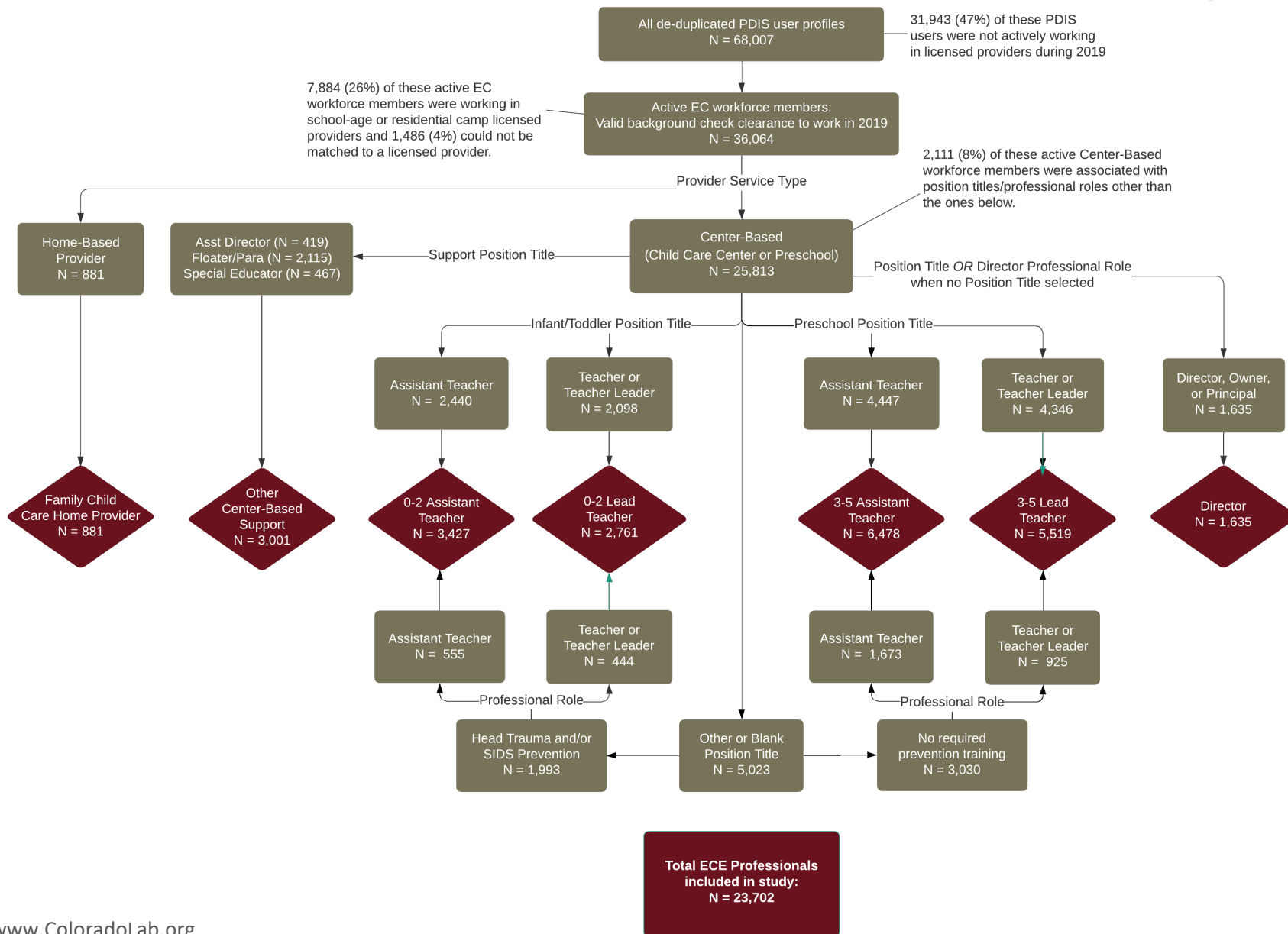
Each of the linked data sources (PDIS, BIU, and QRIS) were essential to properly classify ECE professionals working in licensed facilities into professional roles of interest in this study: Directors, Lead Teachers, Assistant Teachers, FCCHP, and Other Support (Assistant Directors, Floaters, Paraprofessionals, and Special Educators). The flow chart in Figure 1 provides a visual of the sequential decisions that were made to ultimately classify ECE professionals appropriately.

The steps for classifying ECE professionals into professional roles were as follows:

1. Limited the study population to the 36,064 ECE professionals actively working in licensed care facilities during 2019 based on valid background check clearance during or prior to 2019.
2. Separated the study population based on their assignment to a home-based (N=881) or center-based (N = 25,813) licensed facility in 2019. Individuals were assigned to the facility where they worked longest in 2019 based on the background check clearance date. Facility service type was determined through the linkage to QRIS records. Those employed in home-based providers were classified as FCCHP.
3. Classified the 25,813 ECE professionals working in center-based facilities in the order below. Because individuals may select more than one role, they were assigned to the role with the greatest responsibility in their organization.
  - a. Directors: Any individual who selected a position title of “Director.” Also, among ECE professionals who did not specify a position title, included those who selected a general professional role of “Director.”
  - b. 3-5 Lead Teachers: Individuals who selected “Lead Teacher (preschool)” or “Teacher (preschool)” as their position title were classified as 3-5 Lead Teachers (serving children ages 3-5.99 years). Individuals who did not pick a specific age group in their position title were assigned to 3-5 Lead Teacher if they selected a professional role of “Teacher” or “Lead Teacher” and did complete required prevention training to work with infants or toddlers.
  - c. 0-2 Lead Teachers: Individuals who selected “Lead Teacher (infant/toddler)” or “Teacher (infant/toddler)” as their position title were classified as 0-2 Lead Teachers (serving children ages 0-2.99 years). Individuals who did not select a specific age group in their position title were assigned to 0-2 Lead Teacher if they selected a role of “Teacher” or “Lead Teacher” and took either the Head Trauma and/or SIDS prevention training courses required annually when working with infants and toddlers.



Figure 1: Inclusion Criteria for ECE Professional Study Population







- d. 3-5 Assistant Teachers: Individuals who selected “Assistant Teacher (preschool)” as their position title were classified as 3-5 Assistant Teachers. Individuals who did not endorse a specific age group in their position title were assigned to 3-5 Assistant Teacher if they selected a general professional role of “Assistant Teacher” and did not take any required prevention training for working with infants or toddlers.
- e. 0-2 Assistant Teachers: Individuals who selected “Assistant Teacher (infant/toddler)” as their position title were classified as 0-2 Assistant Teachers. Individuals who did not endorse a specific age group in their position title were assigned to 0-2 Assistant Teacher if they selected a general professional role of “Assistant Teacher” and took either the Head Trauma and/or SIDS prevention training courses required annually when working with infants and toddlers.
- f. Other Support: Individuals who selected position titles that demonstrated direct support of children were classified as “Other Support.” This included those with position titles of “Assistant Director,” “Floater” or “Substitute,” “Paraprofessional,” and “Special Educator.” This general Other Support subgroup was included in overall analysis of ECE professionals, but role-specific findings were not presented in the report because there was too much variation in included ECE professionals to make meaningful interpretations.

### Assessing Representativeness of ECE Professionals

It was important to understand how well the ECE professionals included in this study represented the full population of ECE professionals in the state. An assessment of representativeness was conducted to detect approximately how much of the ECE professional population was captured in the linked administrative records using the inclusion criteria for this study. Representativeness was calculated for ECE professionals in the following manner:

**Directors:** The number of Directors was divided by the total number of center-based child care providers, resulting in a proportion of Directors to centers.

**FCCHP:** The number of FCCHP was divided by the total number of home child care providers, resulting in a proportion of FCCHP.

**Teachers (Lead Teachers and Assistant Teachers):** Calculating representativeness was far more complex for teachers. The difficulty was that there was no single source of truth to answer this question. Also, it was unknown how much of the 2019 teaching workforce was employed part time versus full time, which impacted the ability to accurately assess the true size of the workforce. Therefore, an estimate of the *expected* number of teachers (overall and by county) was developed and the size of the study population was compared to this expectation. In order to calculate this comparison, the following steps were taken:

1. The total number of children under age five able to be served by licensed care at the state and county levels was based on licensing capacity available in the QRIS public data for August, 2019.
2. An average ratio of children to teachers was calculated based on Colorado’s maximum staff-to-child ratios for infants (1-to-5), young toddlers (1-to-7), older toddlers (1-to-8) 3- to 4 year-olds (1-to-10) and 4- to 5-year-olds (1-to-12).<sup>35</sup> The average ratio was 1 teacher for every 8.4 children.
3. The licensed capacity of center-based providers was aggregated at the state and county levels and divided by the average teacher to child ratio of 8.4 to obtain the number of expected teachers for



each county. For example, if a county had an estimated 84 children served based on the aggregated licensing capacity, the 84 children would be divided by the average child to teacher ratio of 8.4, resulting in an expected 10 teachers in that county.

- The total number of teachers from this study were divided by the number of expected teachers in the county. This produced a proportion of representativeness for each county. Continuing the example from Step 3, let us suppose that this study had eight teachers in the example county. We would divide the eight teachers from this study by the expected 10 teachers in the county. This would result in a representativeness quotient of 0.80, which can be interpreted to mean that 80% of the county’s teachers were represented in this study.

If ECE professionals were <i>under-represented</i> , it was likely a result of one of following reasons:	If ECE professionals were <i>over-represented</i> , it was likely a result of one of following reasons:
<ul style="list-style-type: none"> <li>The ECE professional did not create a PDIS user profile or did not update their professional role in PDIS.</li> <li>The individual may have held two positions and they were only counted in the position they worked the longest during the 2019 year.</li> <li>The assumptions used in the model to estimate the expected size of the ECE professional population contained some error.</li> </ul>	<ul style="list-style-type: none"> <li>Some teachers may have been working part-time but were assumed to be working full time.</li> <li>The study included teachers active at any point during 2019 including those who held the same position.</li> <li>Some ECE professionals may have moved on to non-teaching positions but had not updated their PDIS profiles to recognize the change in role.</li> <li>The assumptions used in the model to estimate the expected size of the ECE professional population contained some error.</li> </ul>

## Measures

### Demographics

The demographic information for ECE professionals was obtained from both the PDIS user profiles as well as the BIU data. Demographics used in this project included:

- Age.** Age was calculated by subtracting the birth date in the BIU data from January 1, 2020 to reflect age at the end of the year. Age was rounded to the nearest month in order to protect identifying information. Age was categorized into year ranges used by the Bureau of Labor Statistics: 16-20, 20-25, 25-35, 35-45, 45-55, 55-65, 65+.
- Race/Ethnicity.** ECE professionals identified their race/ethnicity in their PDIS user profiles. Due to the small number of individuals selecting certain race/ethnicity categories, some categories were combined for analysis purposes. The categories were analyzed as follows: American Indian, Asian or Pacific Islander, Black, Hispanic, White, and Other or Unknown.



- *Geographic location.* ECE professionals were assigned to their geographic location during the 2019 year. For this report, geographic location was reported at the county level. The online data dashboard will also provide results at the Early Childhood Council and state regions.

### Professional Profiles

ECE professionals self-reported their profile information in the PDIS. Currently, ECE professionals are not prompted at any particular time to refresh this information, so it is possible that some professional profile information was outdated.

- *Professional role.* ECE professionals could select one or more position titles and professional roles in their PDIS user profiles. If an individual selected more than one of these roles, they were categorized to the role that held the greatest responsibility for their organization (e.g., if selected Director and Lead Teacher, assigned to Director classification). For the purposes of this study, the target professional roles of interest were as follows:

Table 1: ECE Professional Role Definitions

Professional Role	Ages served	Licensed Setting	Professional Responsibility
Director	0 to 5.99 years	Public or Private Center-based	Administrative leadership
3-5 Lead Teacher	3 to 5.99 years	Public or Private Center-based	Lead classroom teacher
3-5 Assistant Teacher	3 to 5.99 years	Public or Private Center-based	Assistant classroom teacher
0-2 Lead Teacher	0 to 2.99 years	Public or Private Center-based	Lead classroom teacher
0-2 Assistant Teacher	0 to 2.99 years	Public or Private Center-based	Assistant classroom teacher
Other Support	0 to 5.99 years	Public or Private Center-based	Employed by provider in support role for children
Family Child Care Home Provider (FCCHP)	0 to 5.99 years	Private Home-based	Direct childcare and education

- *Education level.* ECE professionals selected their most recent educational attainment level. Education levels were categorized into the following for analysis: Some High School, High School or GED, Some College, Associate's or Bachelor's Degree, and Advanced Degree.
- *EC professional credential level.* ECE professionals voluntarily choose to participate in the credentialing process offered by the state to recognize their experience and knowledge in serving young children. The EC professional credential is a six-tier system with '1' being the lowest credential level and '6' the highest.



## Persistence and Turnover

The BIU background check data served as the basis for each indicator of stability and turnover in this study. The following indicators were developed for analysis.

- *Years in EC field.* Years in EC field was calculated by summing the number of years since the earliest background check clearance was available (as far back as 2005).
- *Employment change.* The number of employment changes were calculated based on the number of unique background check clearances and/or removals<sup>1</sup> an ECE professional had in their record since 2005. This was only calculated for those who were classified as persistent in the field during the time frames for which turnover was calculated to ensure that this rate captured employment changes among those who were actively seeking employment.
- *Turnover rate.* The following two turnover rates were calculated:
  - *One-year turnover:* A one-year turnover indicator was calculated for ECE professionals by dividing the total number of ECE professionals who had changed employers in 2019 by the total number of ECE professionals who were active in both 2018 and 2019.
  - *Three-year turnover:* A three-year turnover indicator was calculated for a subset of the ECE professionals by taking the total number of ECE professionals who had changed providers at least once between 2017-2019 and dividing them by the total number of ECE professionals who had entered the field prior to 2017 *and* were actively employed during 2017 and 2018.

## Provider Characteristics

Provider characteristics were obtained from monthly QRIS data on all licensed providers in Colorado. An ECE professional was associated with the provider where they worked the longest during the 2019 year.

- *Service type.* Licensed providers were classified into one of three service types in the QRIS data: child care centers, preschools, and home-based providers. These categories were used to support the classification of ECE professionals into accurate professional roles.
- *Quality rating.* The QRIS allows providers to progress in quality ratings from a baseline of a Level 1 rating to a maximum of a Level 5 rating. In Colorado, licensed providers default to a Level 1 if they have chosen not to be assessed for a higher rating level. Providers are assessed every three years unless they request an assessment earlier. Licensed providers can pursue accreditation through alternative pathways such as the National Association for the Education of Young Children's Accreditation or Head Start, which automatically qualifies them for a higher rating level.

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<sup>1</sup> Licensed providers are required to update the state's BIU when a staff member is no longer employed with them.



**Assumptions when calculating the measures for this study:**

- PDIS users have updated their professional roles and educational attainment information to represent accurate information for 2019.
- ECE professionals spent the majority of their time in the position to which they were assigned (i.e., role they selected that was associated with the highest level of leadership).
- Assignment to providers, employment changes, and turnover were based on background check decisions that were timely.



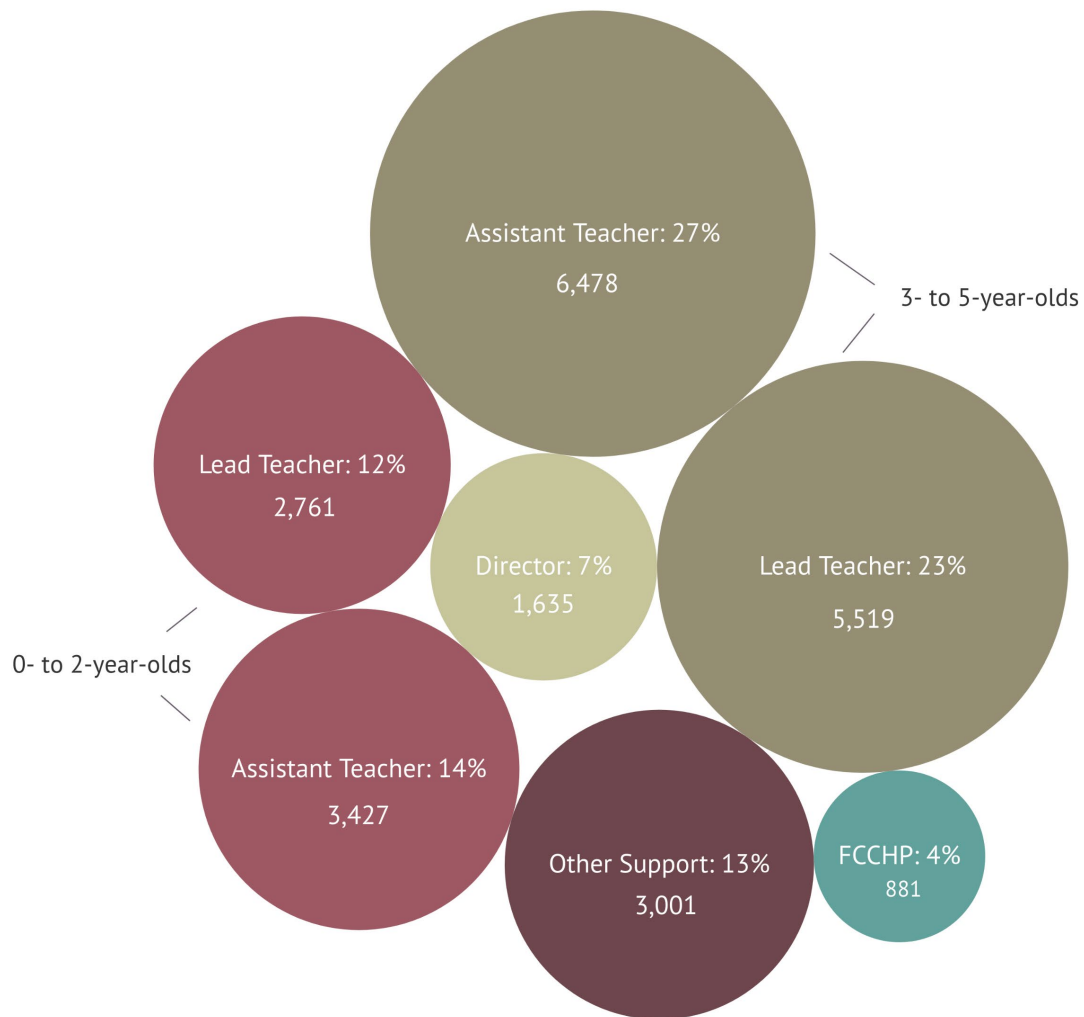


## Results

### ECE Professional Population

There were 23,702 ECE professionals included in the study population. Figure 2 shows the representation by professional role, with 3-5 Teachers (Lead and Assistant) comprising the largest portion (50%) of all ECE professionals. There were more Assistant Teachers than Lead Teachers for both 0-2 and 3-5 age groups. FCCHP only represented 4% of ECE professionals.

Figure 2: ECE Professionals Roles





## Representativeness

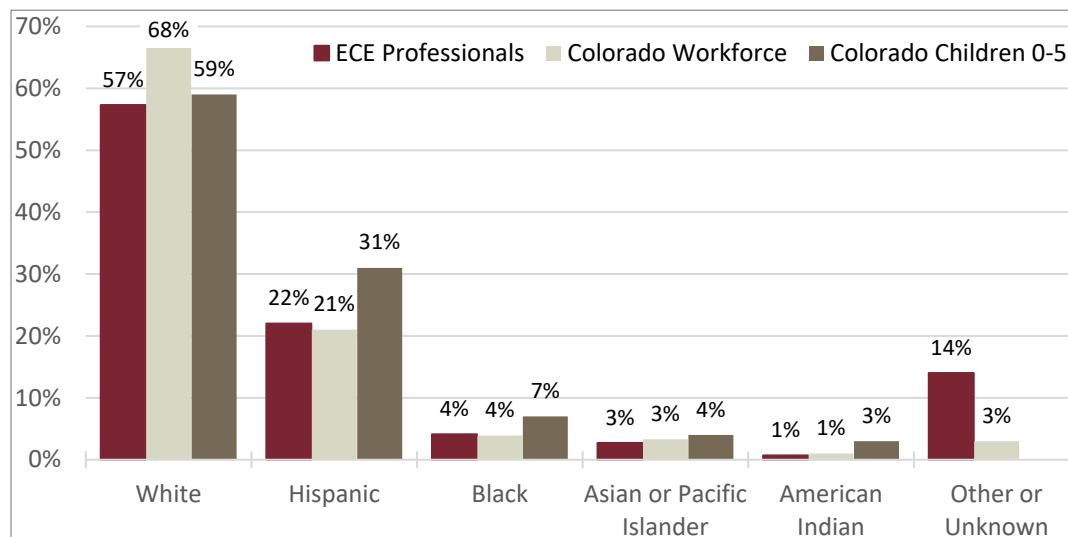
Representativeness of ECE professionals by professional role was calculated according to the methodology detailed in the section entitled [Inclusion Criteria for ECE Professionals in Study](#) in the Methods section. Representativeness findings were as follows:

1. Directors: There were 1,635 Directors in this study overall, and a total of 2,067 licensed center-based EC providers as of August 2019 in Colorado. This resulted in a representativeness of 79%.
2. FCCHP: The Family Care Provider group was particularly underrepresented. This was determined because there were only 881 FCCHP working in 652 different home-based locations in the study. Given there were 1,729 licensed home providers in the QRIS database for August 2019, the study population only captured 38% of the home-based locations in Colorado. Findings were broken out by professional role to take this into account.
3. Teachers: Overall, there were 18,185 teachers (Assistant Teachers and Lead Teachers) working at 1,710 centers identified for inclusion in this study. The total number of expected full-time ECE teachers working in Colorado was 16,708 (140,346 licensed slots for children divided by the average 8.4 children per teacher). The study teacher population was 8% higher than the expected teacher population and represented 83% of Colorado’s 2,067 center-based care facilities—thirty-eight out of 64 counties meeting or exceeding the number of expected teachers, and all but nine exceeded 75% representativeness. The nine counties with the lowest representativeness of teachers did not congregate in one area of the state nor were they exclusively urban (Broomfield, Clear Creek, Elbert, Gilpin) or rural (Custer, Jackson, Kit Carson, Kiowa, Rio Blanco).

## Demographics

Figure 3 compares the race and ethnicity of ECE professionals to key populations of interest in Colorado to gauge how well the ECE field is attracting people of color. Fifty-seven percent of the ECE professional population identified as White compared to 68% of the Colorado Workforce population and 59% of children 0-5 years. Twenty-two percent of ECE professionals identified as Hispanic, comparable to the

Figure 3: ECE Professionals Race/Ethnicity Relative to Colorado Workforce and Children Under Five

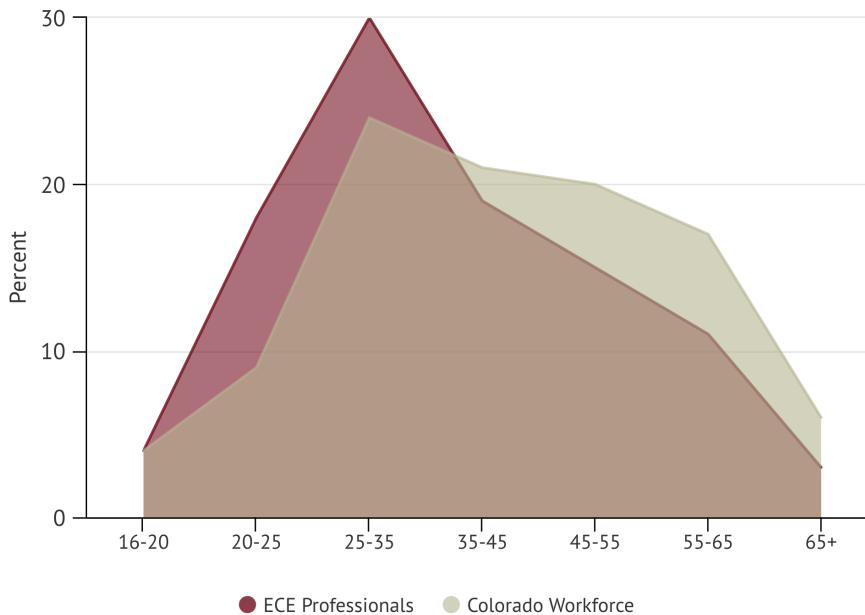




Colorado workforce (21%) but less than children under 5 (31%). It is reasonable to believe that a portion of the 14% of ECE professionals choosing a multiracial category or selecting to leave the race/ethnicity field blank, may have classified themselves as Hispanic or another non-White race/ethnicity selection which would create a more even balance with the population of young children in the state.

Figure 4 shows that the population of ECE professionals skewed younger than the overall Colorado workforce. Half of ECE professionals were ages 25 to 45, with only 30% above 45 years of age.

Figure 4: Age of ECE Professionals Relative to Colorado’s Workforce



## Education and Professional Profiles

The education and professional profiles of Colorado’s ECE professional population are presented in Table 2. Nearly half of all ECE professionals (48%) had obtained a postsecondary or advanced degree. Though it is encouraged for ECE professionals to earn an EC professional credential in order to become eligible for more advanced positions in the field, it is not required. Only 8,730 (38%) of ECE professionals had received a valid EC professional credential before the end of 2019. Among those with a credential, a majority (65%) earned a Level 2 or 3. A smaller proportion of ECE professionals (7%) earned the highest credential levels 5 or 6.

This study also examined the proportion of ECE professionals working for providers in each Colorado Shines quality rating level. Almost a third (29%) worked for licensed providers that had not been assessed for a Colorado Shines rating and remained at a Level 1. A notable jump occurred at Level 4, which was expected due to the alternative pathways for provider ratings. If providers submitted proof of accreditation by a recognized early childhood organization (e.g., the National Association for the Education of Young Children), providers were automatically advanced to a Level 4 quality rating. This created a boost in the percentage of providers in this rating level, and correspondingly, a jump in the number of ECE professionals working at this rating level. Only two percent of ECE professionals worked in a provider that had advanced to a Level 5 rating.



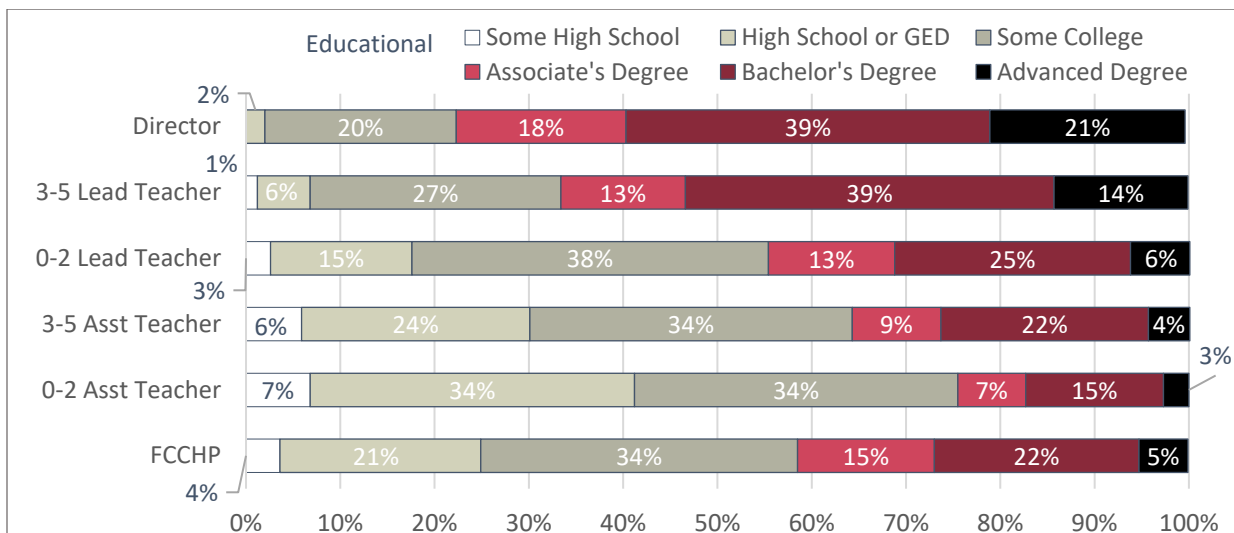
Table 2: ECE Education and Professional Profiles

Education and Professional Profile	Percent of ECE Professionals
<b>Educational Attainment</b>	
Some high school	4%
High School or GED	18%
Some College	31%
Associate’s Degree	11%
Bachelor’s Degree	27%
Advanced Degree	9%
<b>EC Professional Credential</b>	
Level 1	18%
Level 2	36%
Level 3	29%
Level 4	10%
Levels 5-6	7%
<b>Provider Quality Rating</b>	
Level 1	29%
Level 2	24%
Level 3	10%
Level 4	36%
Level 5	2%

### Educational Attainment

The educational attainment of ECE professionals by professional role trended as expected (see Figure 5). Directors had the highest rate of postsecondary or advanced degrees (60%), closely followed by 3-5 Lead Teachers (53%), dipping considerably for 0-2 Lead Teachers (44%), and steadily decreasing to only 25% of 0-2 Assistant Teachers. FCCHP and 0-2 Lead Teachers experienced similar educational attainment, with 42-44% earning at least a college degree.

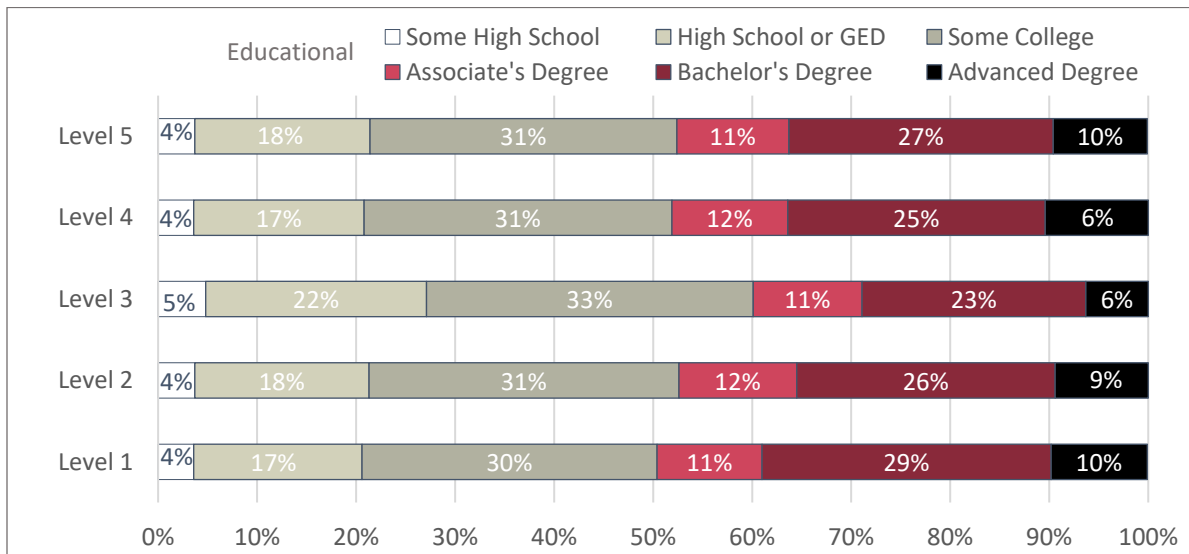
Figure 5: Educational Attainment by Professional Role





An examination of educational attainment by provider quality rating levels showed that an increase in provider quality rating did not relate to an increase in the educational attainment of the ECE professional workforce (see Figure 6). The proportion of ECE professionals attaining a postsecondary or advanced degree was consistent across Levels 1 (51%), 4 (48%), and 5 (52%). This proportion dipped for ECE professionals working in providers rated at a Level 2 (37%) or a Level 3 (40%).

Figure 6: Educational Attainment by Provider Quality Rating Level



**Providers selecting not to go through the quality rating process (Level 1) were employing similarly educated staff to providers at the highest rating levels. This may indicate that a portion of providers already had a base of community members recognizing their quality of care and were not reliant on the quality rating to draw enrollment or to retain resources for quality improvement.**

### Early Childhood Professional Credential

Approximately half of Directors and Lead Teachers (both 0-2 and 3-5) had earned a valid EC professional credential. As with educational attainment, the EC professional credentials among 0-2 Lead Teachers looks very similar to FCCHP, with just over half earning a Level 1 or 2 credential and roughly a third earning a Level 3 (see Figure 7). Less than 5% of Assistant Teachers earned the highest EC professional credential Levels 4-6, and the proportion earning these higher credential levels grew for Lead Teachers (13-21%) and is largest for Directors (43%).

When examining EC professional credentials, it is important to note the proportion of ECE professionals in each role who had a valid credential (grey bars in Figure 7). Less than a quarter of FCCHP and Assistant Teachers (both 0-2 and 3-5) had earned a credential. This should be taken into consideration when interpreting EC professional credential distributions.



Figure 7: EC Professional Credential Level by Professional Role

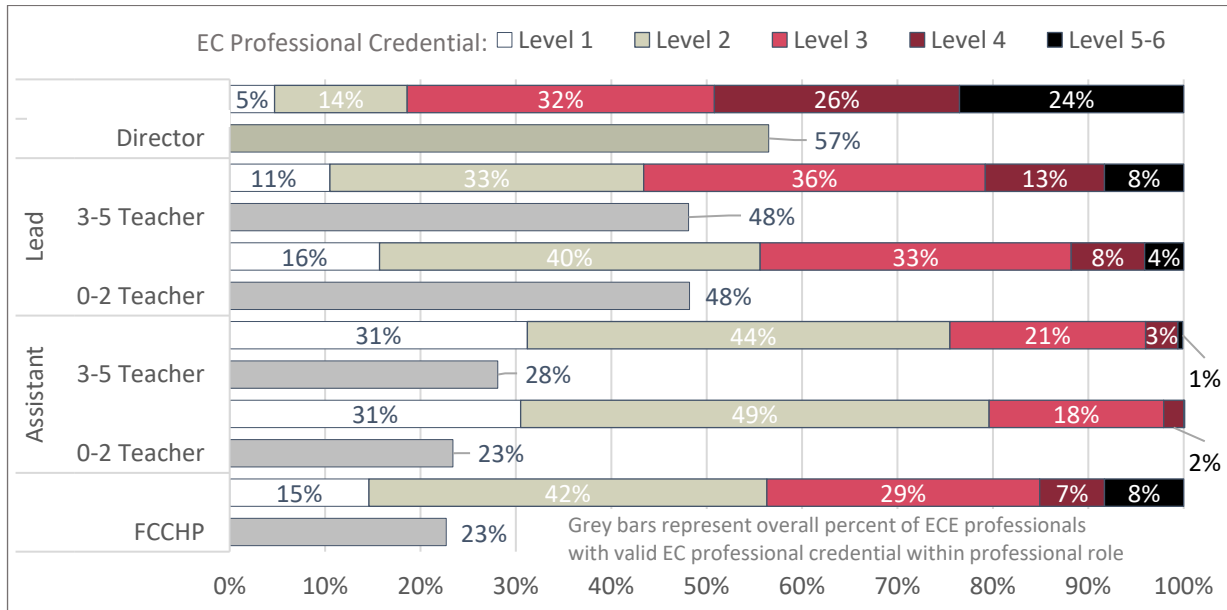
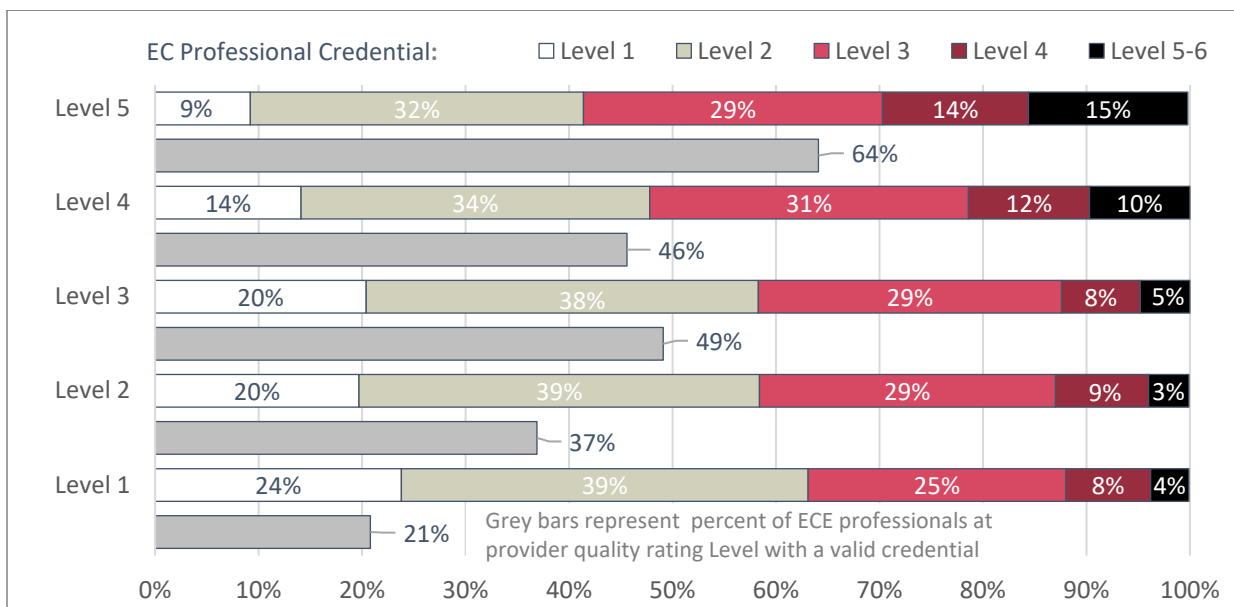


Figure 8 breaks down EC professional credential levels by the quality rating of the providers in which the ECE professionals were employed. Over three times the proportion of ECE professionals had an EC professional credential if they were in a Level 5 rather than a Level 1 provider (see grey bars). The growth in valid EC professional credentials dipped slightly for those in a quality rating Level 4 provider, which is likely explained by the alternative pathways for quality rating mentioned earlier in this report. If providers were completing expected requirements for an alternative accreditation process, it is reasonable to assume that the ECE professionals in these providers were meeting credentialing expectations through another pathway as well, making the EC professional credential less critical for their employment.

Figure 8: EC Professional Credential Level by Provider’s Quality Rating Level





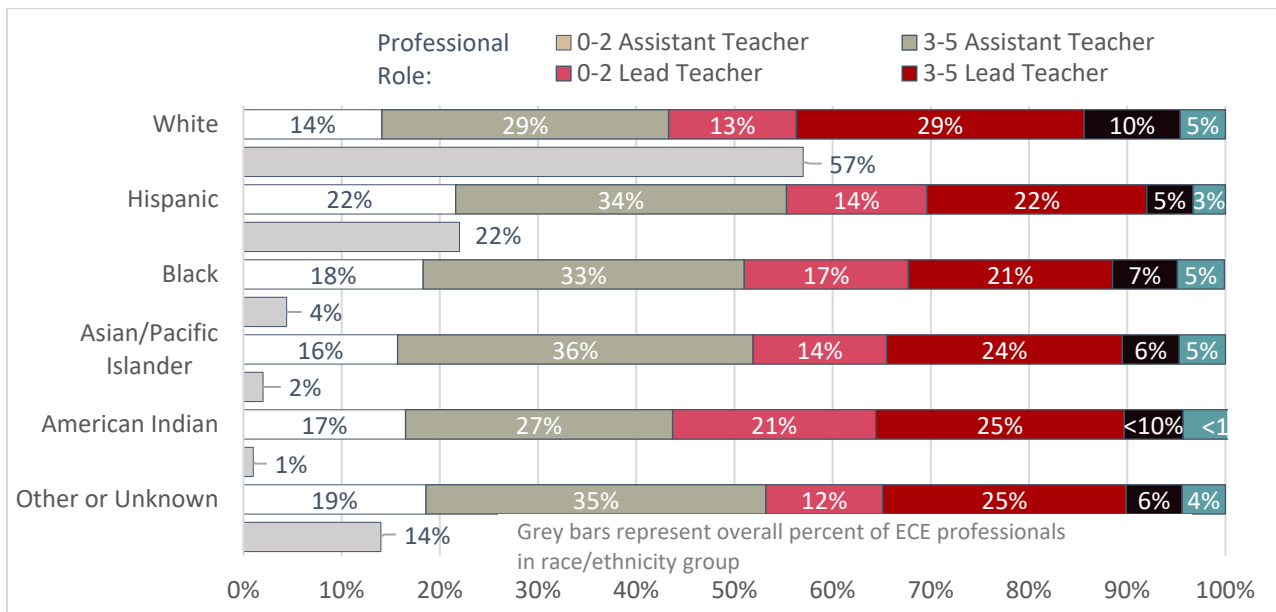


The differences in EC professional credential levels by provider quality rating level were steady and in the direction one would expect – ECE professionals working in higher rated providers were earning higher EC professional credentials. Fifty-eight percent of ECE professionals in the highest-rated providers earned a Level 4, 5, or 6 compared to 37% of ECE professionals working in unrated (Level 1) providers.

### Racial and Ethnic Differences in Education and Professional Profiles

The education and professional attainment of ECE professionals was examined by race/ethnicity to assess how equitably the ECE workforce was progressing in the field. Disparities by ECE professional roles were revealed in this study, with the biggest gap occurring among White and Hispanic individuals (Figure 9).

Figure 9: Racial Differences in Professional Role



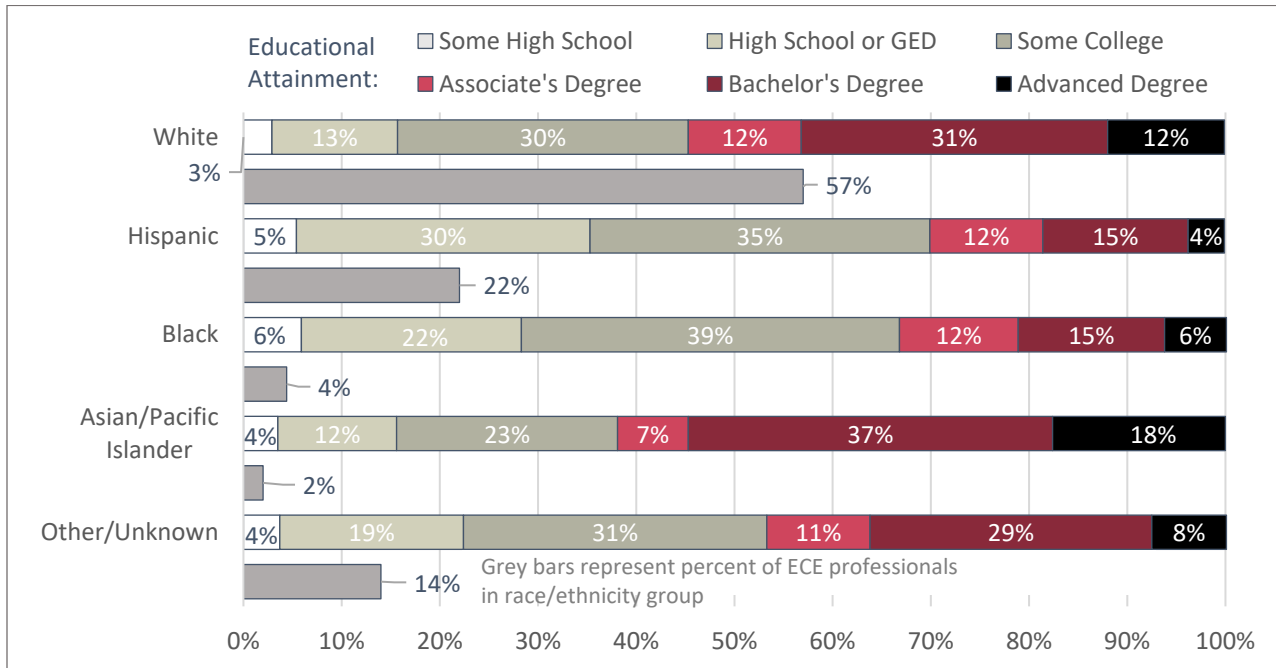
White ECE professionals held leadership roles in center-based care (Lead Teachers and Directors) at higher rates (52%) than Hispanic (41%) ECE professionals. The Director position had the largest disparity, with White ECE professionals holding this position at twice the rate of their Hispanic colleagues.

A look at educational attainment demonstrated clear disparities as well (see Figure 10). White ECE professionals had the highest percentage of college graduates (55%) compared with only 30% of Hispanic and Black ECE professionals. Conversely, only 13% of White individuals in the study had a high school diploma or GED as their highest level of education, which was less than half the rate among Hispanic ECE professionals (30%).

**Despite having the lowest rate of postsecondary degrees, Black (39%) and Hispanic (35%) ECE professionals were most likely to have some college experience while working.**

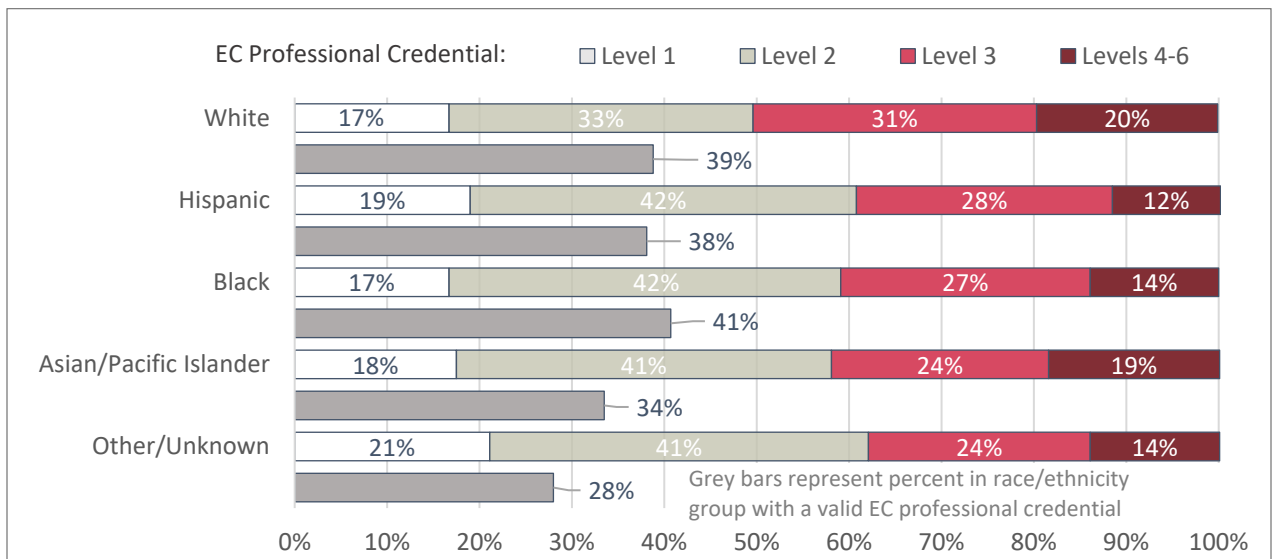


Figure 10: Racial differences in educational attainment



A similar picture of racial/ethnic disparities was also demonstrated for EC Credentials. Half of White ECE professionals who had a valid EC professional credential were earning a Level 3 or higher compared to only 40% of Hispanic ECE professionals (Figure 11). It was shown that Hispanic and Black ECE professionals were receiving a valid EC professional credential at rates consistent with White ECE professionals, demonstrating a comparable commitment to this professional development pathway.

Figure 11. Racial Differences in EC Professional Credentials

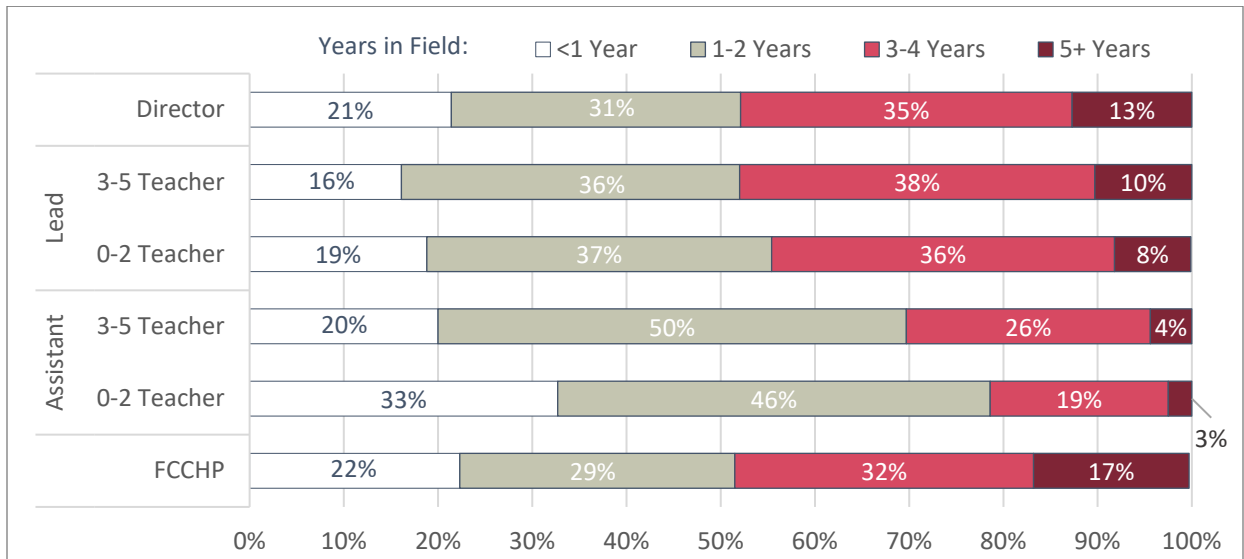




## Persistence and Turnover

The median years worked among all ECE professionals was two years. Overall, 8,808 (37%) ECE professionals in this study were persistent in the field for three or more years (see Figure 12). Directors, Lead Teachers (both 0-2 and 3-5) and FCCHP were similar in their persistence, with 48% remaining in the field for three or more years.

Figure 12. Years in the EC Workforce by Professional Role

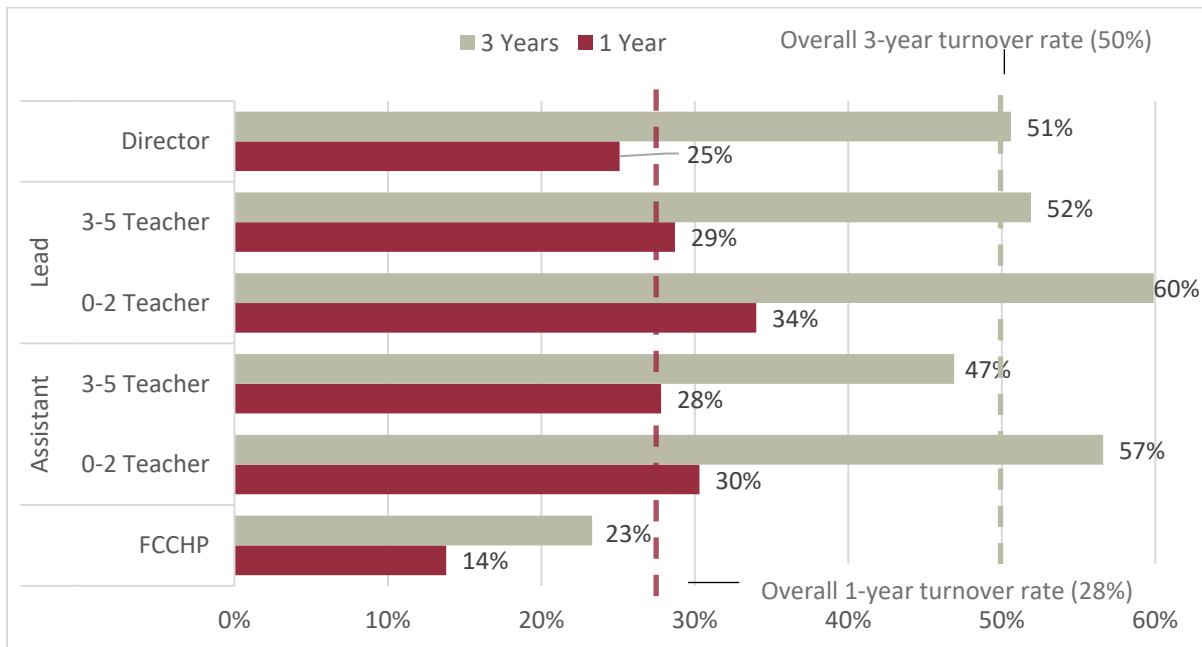


Overall, 5,039 (21%) of ECE professionals were new entrants to the field in 2019. This was highest among 0-2 Assistant Teachers (33%). This was not entirely surprising as 0-2 Assistant Teacher roles are generally considered entry-level positions in the field and ECE professionals are likely to grow into greater leadership positions as time passes. The smallest rate of new entry occurred among 3-5 Lead Teachers, indicating that most 3-5 Lead Teachers began their ECE professional career in an entry-level position before reaching a Lead Teacher role.

One-year and three-year turnover rates were calculated for individuals who had been in the field for a sufficient time period to experience each (see Figure 13). Among the 18,151 ECE professionals who had been in the field since at least 2018, over 5,000 (28%) had experienced at least one job change in 2019. The highest turnover was occurring among 0-2 Lead (34%) and Assistant (30%) Teachers, while the greatest stability was demonstrated among FCCHP (14%) followed by Directors (25%). Turnover rates were generally higher among Lead Teachers compared to Assistant Teachers, capturing a general trend of promotion from Assistant to Lead Teachers.



Figure 13. Turnover among ECE Professionals



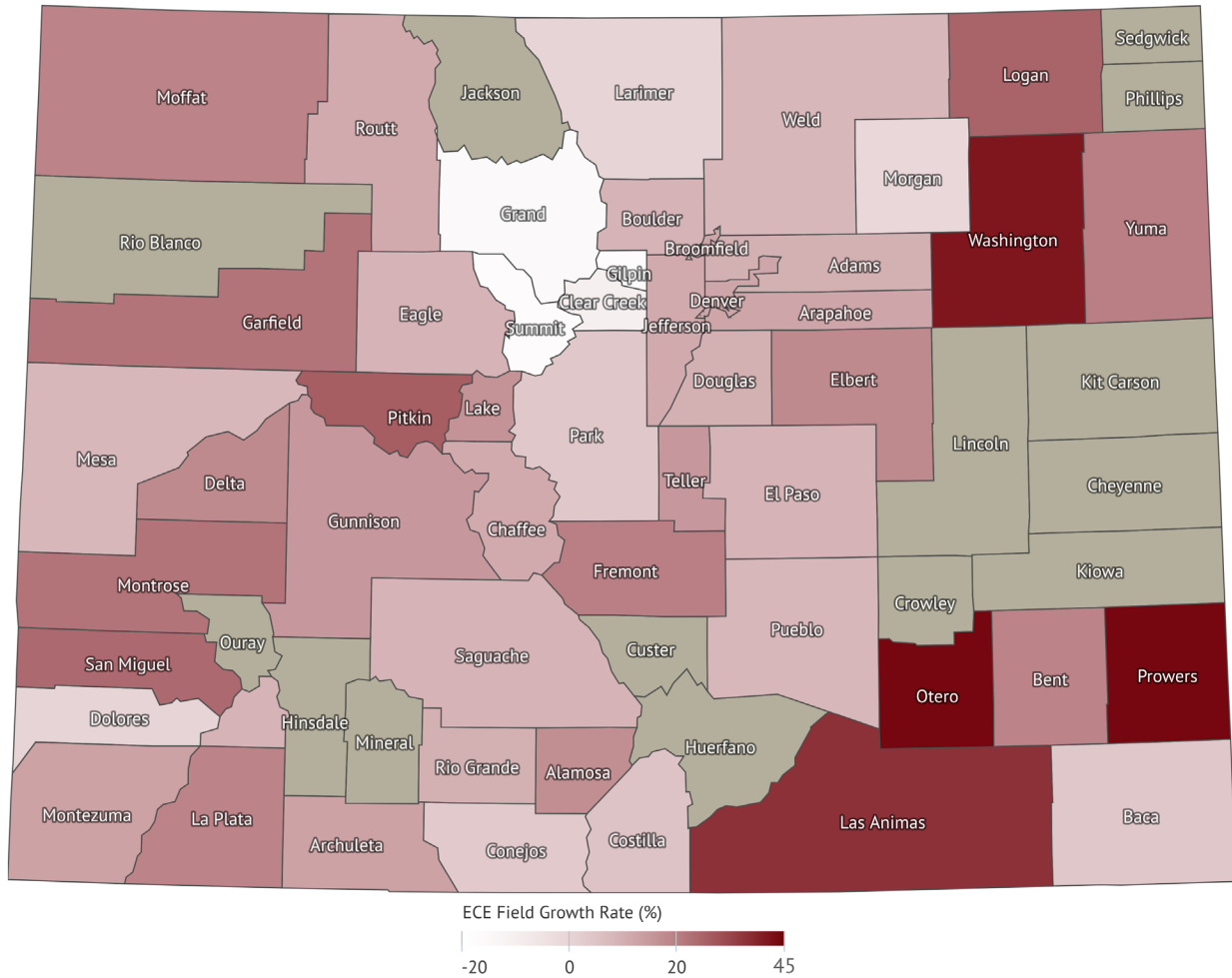
Three-year turnover trends were similar to the one-year trends. Overall, over half (51%) of the 8,654 ECE professionals who had been in the field for three or more years had changed jobs at least once between 2017 and 2019. Once again, the group most resistant to turnover over three years of ECE employment were FCCHP, with almost half having worked in the field for three or more years and only 21% of those making a job change. Conversely, only 22% of 0-2 Assistant Teachers had been in the field for three or more years, and 60% of this group changed jobs between 2017 and 2019.

It should be recognized that this study did not assess whether one- or three-year turnover experiences were related to lateral job movement or progression in the ECE field to higher leadership positions. These measures of turnover were agnostic to the “quality” of the move for individual ECE professionals. This was evident in the heightened rate of turnover among Lead Teachers compared to Assistant Teachers. It must be remembered that turnover was only analyzed among those individuals who had been actively working for a period of time. Therefore, the turnover among Lead Teachers combined both lateral moves (a Lead Teacher position at a new provider) as well as upward moves (previously Assistant Teacher moving into Lead Teacher role at new provider). However, because the Assistant Teacher role is an entry-level position, their turnover rate generally represented only prior lateral moves. Nonetheless, all moves represent loss or gain of new ECE professionals from a provider’s and family’s perspective.

The growth rate by county (percentage new to the field in 2019 minus percentage who left the field in 2019) is shown in Figure 14. The overall growth rate for Colorado was 11%, and the highest was in rural and frontier counties.



Figure 14. ECE Professional Growth Rate by County



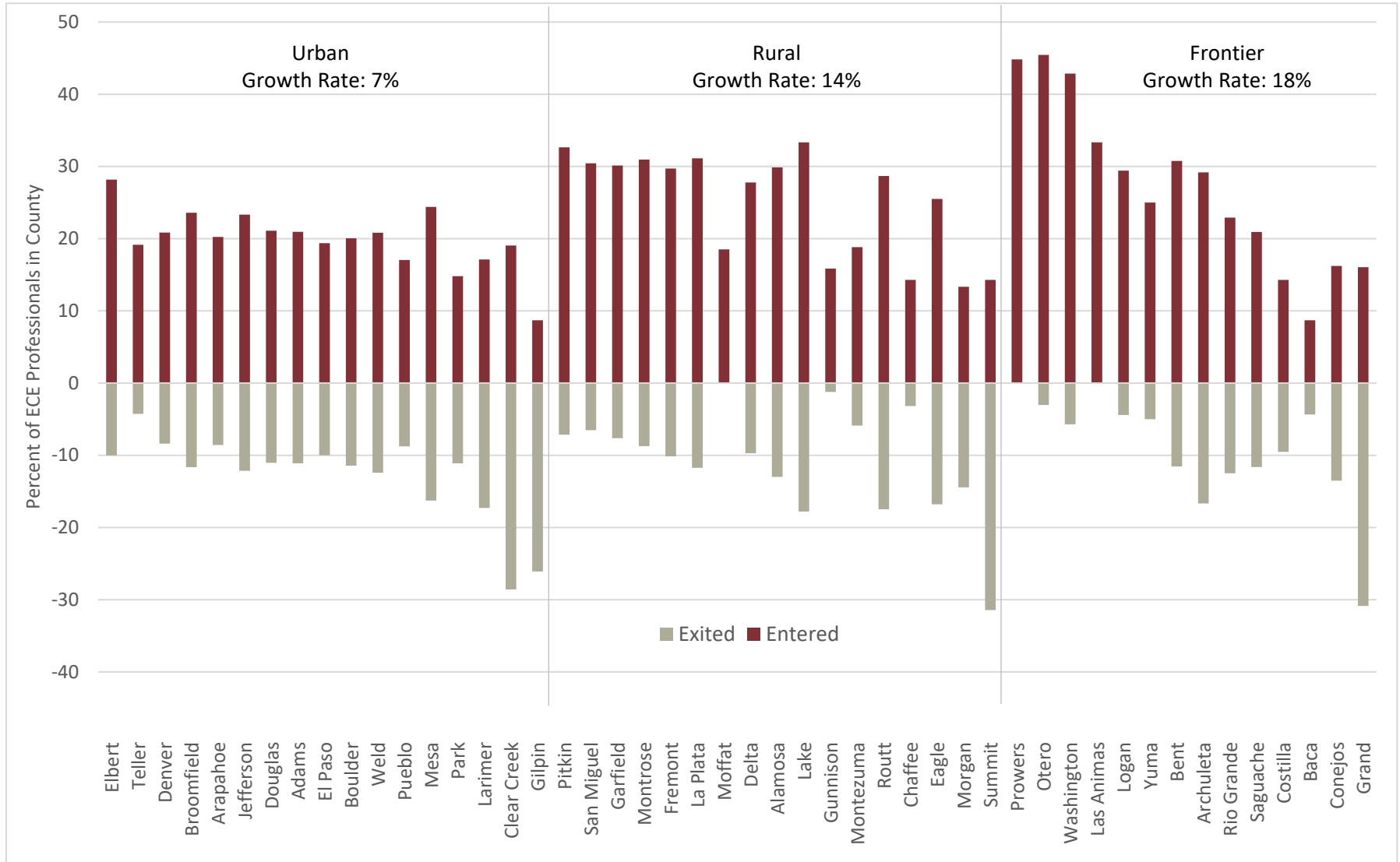
NOTE: TAN COUNTIES HAD FEWER THAN 20 ECE PROFESSIONALS AND WERE REMOVED FROM THE MAP FOR CONFIDENTIALITY

Growth by county was further broken down to show the proportion of those who entered and exited the field in 2019 to represent recruitment and retention (see Figure 15).<sup>2</sup> Statewide, 21% of ECE professionals were new to the field and 10% left the field in 2019. The growth rate of ECE professionals in rural counties doubled the growth rate in urban counties, and frontier counties had the highest growth rates overall. Several counties demonstrated high levels of both recruitment (percentage who entered) and retention (percentage who exited), including Moffat, Gunnison, Prowers, Otero, Washington, and Las Animas. Counties with high tourist activity and those near the urban centers that served as commuter areas showed significant movement in and out of the field, with more loss of ECE professionals than gain (e.g., Summit, Grand, Gilpin, and Clear Creek counties). These findings may relate to the high cost of living in these areas and seasonal ECE needs that make it difficult to stay in ECE professional roles.

<sup>2</sup> Counties with fewer than 20 ECE professionals were not displayed to maintain confidentiality and reliability.



Figure 15. Percentage of ECE professionals who entered and exited the field in 2019 by county







## Conclusion

This study represents the first statewide comprehensive picture of the ECE professional workforce in Colorado. It leveraged the administrative data already being collected in the state's OEC, with each source of data contributing an essential component to our understanding of who is in the ECE professional workforce, their educational and professional profiles, and movement into and within the ECE field.

Overall, there were some key insights from this work that can help focus the attention of program, policy, and community leaders across the state who are striving to improve conditions of the ECE workforce. First, this study confirmed findings from the *Colorado Shines Brighter* needs assessment that there was an imbalance in the ECE professional workforce between 0-2 and 3-5 serving teachers.

This study also showed that infant and toddler teachers had higher turnover rates and lower engagement in professional growth pathways such as completion of a college degree and lower participation in the EC professional credentialing process. This suggests a need to continue professionalizing infant and toddler teaching roles so as to incentivize recruitment and retention of individuals who view these positions as desirable careers as opposed to quick steps to an alternative professional goal.

Racial disparities in leadership roles and EC professional credentials suggested a need to leverage the professional development pathways already being sought by ECE professionals of color including postsecondary enrollment and EC professional credential participation. The state needs to improve support for ECE professionals of color, particularly Hispanic teachers, to seek out leadership roles if they are desired. This study also revealed larger growth in the population of ECE professionals in many rural and frontier counties, a desirable finding given the state's emphasis on improved ECE offerings in rural areas.

The findings presented in this report represent a broad stroke of information from the data that were assembled and refined for this study through LINC's data integration capacity. One valuable result of this work lives in the de-identified data assets that were developed and can be routinely updated. These data can be dissected by any number of geographic areas by the OEC team as well as the wider community of government partners, community stakeholders, and ECE providers to answer their own questions. This ECE workforce data dashboard will provide a critical baseline for regional and county information on the ECE workforce prior to the COVID-19 crisis. As efforts continue to get underway to support the rebound of the ECE sector in the wake of COVID-19 and beyond, this ECE workforce data dashboard will be critical for tracking impacts and potentially valuable solutions to alleviate the effects on ECE workforce members.



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