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*A Workforce on the Brink of Collapse with
Devastating Consequences for Children*

The High Cost of Working in Early Childhood Education

January 2023

Acknowledgements

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Introduction

There is no doubt that high-quality early childhood education (ECE) is a win for everyone – children, parents, employers, and our economy. Yet this critical sector is on the brink of a breakdown. Nearly 50% of surveyed early childhood educators did not think it was likely that they would be working for their employer within five years. This comes shortly after recent Bureau of Labor Statistics data showed that the early childhood workforce is still missing over 100,000 workers across the country¹ despite the rest of the economy rebounding from the pandemic. Other industries rely on the early childhood workforce to operate.² Those industries' workforce shortages are intricately entwined with the labor shortage in early childhood.

Additionally, the cornerstone of high-quality early childhood education is a credentialed and skilled workforce. The exodus of this early childhood workforce will inevitably drive down quality in programs, as it is largely staff with bachelor's and master's degrees that intend to leave. Even before the pandemic, the low wages of the sector took a strain on early childhood education programs and families nationwide, fueling continual staff turnover and program instability, two things which damage program quality.³ For children, that adds up to caretaking disruptions during what science has identified to be a critically important and developmentally sensitive time for the brain.

The number one factor educators would stay is for higher wages. But the tuition parents pay for child care already

surpasses the cost of attending a public college in Pennsylvania, making affordability a real challenge for parents. As a result, early childhood education providers can't afford to raise tuition to increase wages for their staff.

Inaction in addressing the low wages of the sector will have serious repercussions for our economy. Pennsylvania, which has one million working parents with children younger than six years old, already loses an estimated \$3.47 billion annually as a result of child care breakdowns, causing parents to miss work and leave their jobs, according to a study by the U.S. Chamber of Commerce Foundation in partnership with the Pennsylvania Chamber of Business and Industry and the Pennsylvania Early Learning Investment Commission.⁴ That number includes approximately \$591 million in tax revenue lost annually because of child care issues. With 565,000 children in Pennsylvania needing child care, a stable early childhood workforce is key to keeping the Commonwealth's economy healthy.

To understand the depth of the stress on the child care sector, Children First secured the support of the Office of Child Development and Early Learning (OCDEL) and the Department of Labor and Industry to gather data from approximately 30,000 early childhood educators in Pennsylvania.⁵ Low wages, however, are only one aspect of the hardship these educators face, according to a survey of 3,429 early childhood educators who live in every county.⁶



Wages are Inadequate and Inequitable

Through the results of the wage analysis and survey, we've learned that:



Early childhood teachers earned an estimated **\$12.43 per hour or less than \$25,844 per year.**



In 100% of the 67 Pennsylvania counties, earnings failed to meet the cost-of-living. In other words, earnings are not sufficient to cover basic necessities like housing, transportation, food, and child care.⁷



Wages varied widely across the state from an annual high of **\$31,320** in Union County to a low of **\$15,408** in Elk County.



There are racial disparities even after job title, education, geography, and program quality are taken into account. Black educators earn approximately **2% less** than their white counterparts. Hispanic educators make **5% less**, and other groups, including Asian and multiracial educators, make **10% less** than white educators.



It pays to be educated. Again, taking into account job title, geography and program quality, teachers with at least a bachelor's degrees make 26% more than those with a high school diploma or only some college, which translates to **earning an additional \$5,803** per year.



Quality pays better. Considering ECE worker education, geography and education, staff working at high-quality programs (STAR 3 or 4) **earn 12% more** than those working at a STAR 1 or 2 program, which translates to earning an additional \$2,971 a year.



However, educators are **unable to recoup their higher education costs because of the low pay** of the early childhood education sector. This has serious implications for whether educators will ultimately stay in the sector in the long run.

Early Childhood Workforce on the Brink of Collapse



Almost **50%** of these educators say they do not plan to or unsure of whether they will remain in their jobs in the next five years. More than half (**53%**) identified a higher salary as the most important factor in staying with their current employer.



Turnover will mostly likely affect program quality. Of respondents who indicated they are likely or very likely to leave their jobs within five years, **39%** had bachelor's degrees and **18%** had master's degrees. This would inevitably impact the quality of education young children receive.



Educators struggle to cover costs of necessities on their salaries. Approximately **21% of the staff relied on SNAP** benefits and **21% were insured by Medicaid.** This was the case even though most survey respondents had a college education.



Fifty-four percent of respondents said they do not have an emergency fund to cover three months of expenses and **60%** said they would not be able to accommodate or pay their daily expenses with a surprise \$400 expense.



A shocking 44% said they had to use a payday loan or borrow money from friends and family in the past six months **to cover basic expenses.** This is in stark contrast to the general public, of which **6%** had utilized a payday loan.⁸



Black educators were **11 percentage points** more than white educators to have utilized a payday loan or borrowed money from a friend. Black educators were also **12 percentage points** more likely to not have a rainy-day fund compared to their white educator counterparts.



Early educators' finances harm their mental wellbeing, with most respondents saying they feel stressed out about their finances and **29%** saying they worry about their finances on a daily basis.

The findings indicate that earnings and benefits are an important part of keeping a stable workforce. In turn, a stable workforce is essential to maintaining quality programming and to make it possible for parents and employers to prosper.

RESULTS 1. Early Childhood Teachers Earn Less than \$13 an Hour

Based on a review of approximately 30,000 wage records, early childhood teachers earned an estimated annual salary of \$25,844 which translates to an hourly earning of \$12.43.⁹ Teachers earn only five cents more than other staff with less credentials. Low wages in the sector make the positions less attractive and, and at the expense of the developmental needs of children, cause high turnover. In fact, early childhood teachers earn less than retail, landscaping, and home health care workers. Kindergarten teachers earn more than twice what early childhood teachers are earning, a significant finding given that many early childhood teachers have similar credentials and job duties as kindergarten teachers.

Table 1. ECE Teachers Paid Less Than \$13 Per Hour

	Estimated Annual Earnings*	Estimated Full-Time Hourly Rate
Owners/Directors	\$47,917	\$23.04
Teachers	\$25,844	\$12.43
Other Staff	\$25,743	\$12.38
Total Sample	\$27,094	\$13.03

*Based on Quarter 2, 2021 earnings.

*Estimated annual earnings based on Quarter 2, 2021.

**Estimated annual earnings, May 2021, retrieved from - https://www.workstats.dli.pa.gov/Documents/Occupational%20Wages/PA_ow.xls.

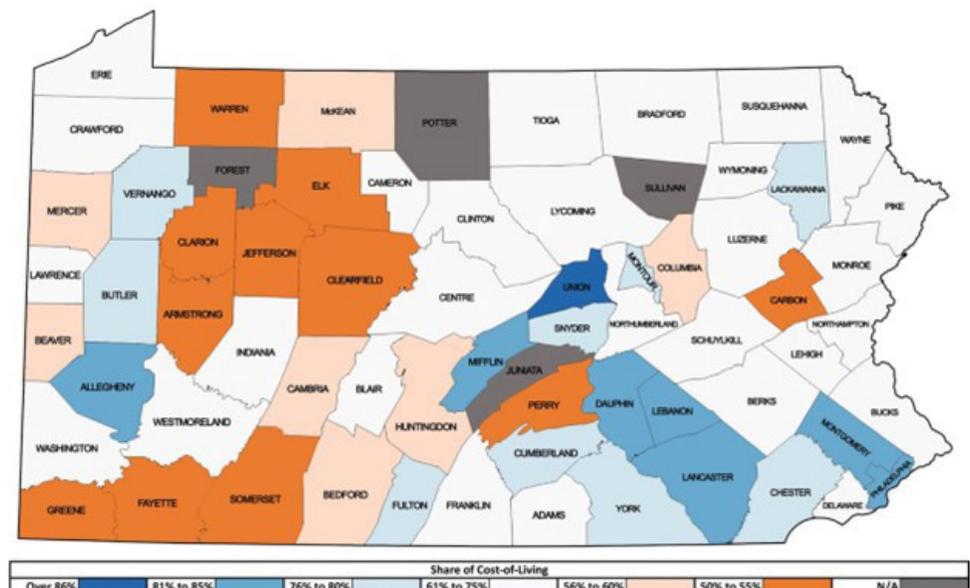
Table 2. ECE Teachers Earn Less Than Workers in Other Industries

Occupation	Annual Earnings
ECE Teachers*	\$25,844
Retail Salesperson**	\$27,390
Maid / Housekeeper**	\$27,820
Hair Stylists**	\$28,390
Home Health Aide**	\$28,390
Landscaper**	\$32,730
Kindergarten Teacher**	\$62,820

RESULTS 2. Earnings Do Not Meet Cost-of-Living

Unsurprisingly, given the diversity of Pennsylvania, wages varied widely with an annual high of \$31,592 in Union County to a low of \$15,408 in Elk County. Nevertheless, the wages paid are inadequate in each county in the state. Cost-of-living calculators, like those created by MIT, allow for comparison of wages to determine if they cover basic necessities like housing, food, transportation, and medical care.^{10,11}

In 11 counties, educators earn less than 55% of what it costs to live in their counties. In most cases, educators are earning between 60-75% of what it would cost to live in their respective counties. The only county that comes close to meeting the cost-of-living is Union County, which meets 97% of the cost-of-living; however, that county is the exception when considering trends across the state.



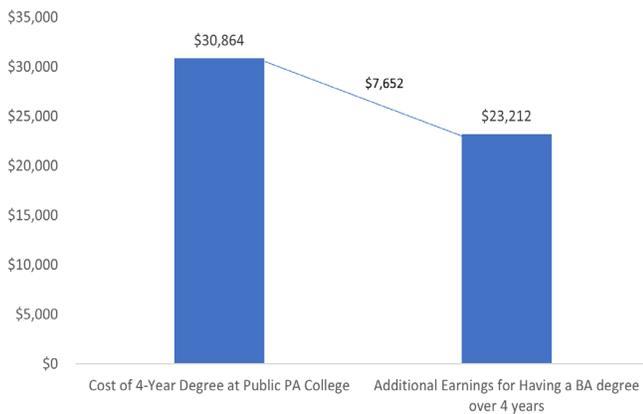
RESULTS 3. Low Wages Drive Down Quality

The median earnings data found that individuals with bachelor's degrees earn \$12,672 more than those with a high school diploma or some college.¹² **However, after adjusting for variations in geography and other characteristics like job title, program quality, and education level, we learn that teachers with bachelor's degrees make 26% more, which translates to earning an additional \$5,803 per year.** In other words, earning a college degree boosts annual pay less than \$6,000, while paying the average in-state tuition for a public college in Pennsylvania is \$7,716 per year, or \$30,864 total in order to earn a bachelor's degree.¹³

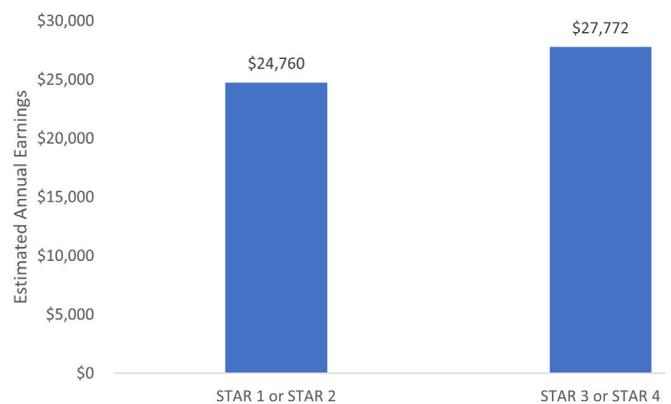
A simple cost analysis tells us that it may not pay to obtain a bachelor's degree given the marginal return on that investment. Yet, a credentialed workforce trained in the science of early learning is essential to providing quality early childhood education programming for young children. The current wages educators with a college degree in early childhood are earning do not reflect their important contributions to the field.

Similarly, comparing median earnings show that working at a high-quality program translates to receiving \$3,012 more a year. This is not surprising, given the subsidy add-on reimbursement rate to high-quality programs in Pennsylvania. However, once characteristics like where individuals live are taken into consideration, staff who work at a high-quality (STAR 3 or 4) program earn only 12% more than those who work at a STAR 1 or 2 program, which translates to earning an additional \$2,971 a year. In sum, **individuals who take the time to complete a higher degree and work at a high-quality program are not able to recoup the cost of their education in the near future.** While it is true that workers can recoup the cost of the education over the lifetime of their entire careers, many low-wage workers do not make decisions to stay in certain fields based on what they will ultimately earn by retirement.

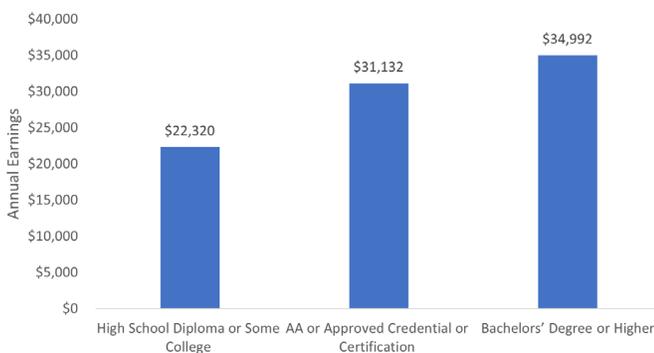
Graph 1. Four-Year Degree Costs More Than Early Educators Can Make



Graph 3. Working at High-Quality Programs Only Minimally Increases Pay for Teachers



Graph 2. More Education Equals More Pay for Early Childhood Workforce¹⁴



Racial disparities are pervasive with educators who identify as Black, Hispanic, Asian, and multiracial. They earn less than white educators even after taking into consideration their job title, education level, location, and the level of quality in the program in which they work. In other words, Black educators who have the same education level and job title, and work in the same geographic area and in programs of the same quality, would still earn less than their white counterparts. The discrepancy is wider with Hispanic educators earning 5% less than white educators and educators in the "other" category, like those who identify as Asian or multiracial, earning 10% less.

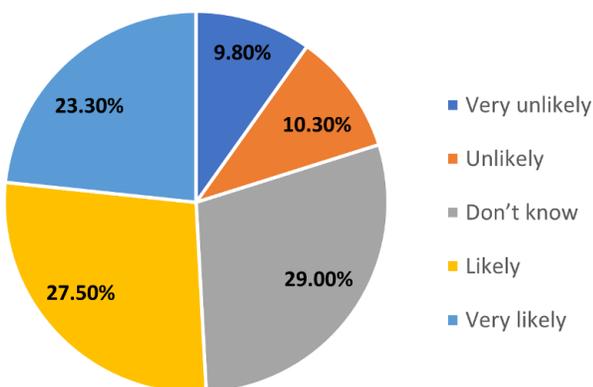
RESULTS 4. Low Wages Mean Volatility and Dependence

A survey of 3,429 early childhood educators demonstrated a workforce in severe distress.¹⁵ The respondents were mostly women (83%), ages 26-45 years old (63%), who work at a center-based program (93%). Overall, the sample was more likely to have teachers who taught toddlers (60%) or pre-k children (62%), though it should be noted that educators were able to identify as teaching more than one age group of children. Finally, 40% of educators had been working in child care for 11 or more years and over half had either an associate's degree or bachelor's degree.

The respondents made it clear that there will be significant turnover in the early childhood workforce over the next five years if wages are not addressed systematically, as **almost 50% of respondents say they do not plan to be in their jobs in five years**. Of those who indicated that they are very unlikely or unlikely to still be working in five years, **most respondents had either a bachelor's degree (39%) or master's degree (20%)**. The number one factor why respondents said they would stay is if there were higher wages, however career advancement opportunities and better job benefits were also important.

Almost 65% of respondents shared that they applied for some type of public benefit in the last two years. Approximately 21% of respondents were enrolled in SNAP benefits. Additionally, 21% of the respondents were enrolled in Medicaid, also indicating that their salaries qualified them for this public benefit.

Graph 4. Nearly Half of Educators Unlikely to Stay



Graph 5. Substantial Number of Teachers at Risk of Leaving Are Highly Educated

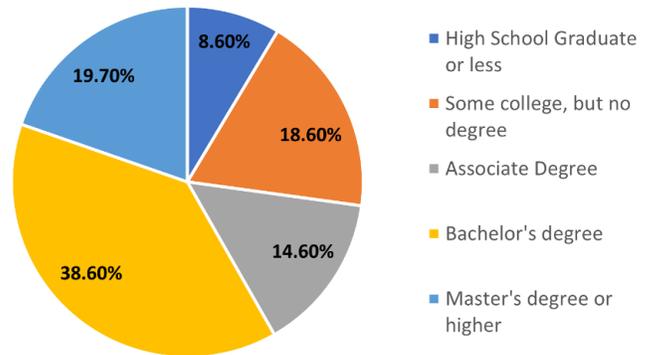


Table 3. Most Educators Used Some Public Benefits in the Last Two Years*

Have you or anyone in your household applied for any of these public benefits within the last two years?	Count	Percent
SNAP	681	21.3%
Medicaid	656	20.6%
Child care/early childhood education subsidy	461	14.4%
SSI	438	13.7%
CHIP	333	10.4%
WIC	245	7.7%
Subsidized Housing	211	6.6%
TANF	114	3.6%
None	1,205	37.8%

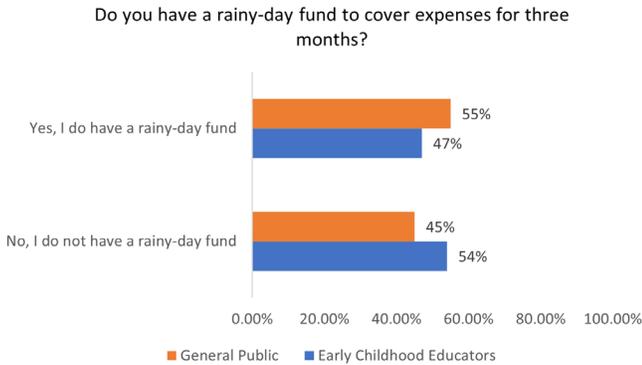
*Respondents were allowed to check more than one benefit.

Many early childhood educators live financially precarious lives, often on the brink of being unable to accommodate emergencies with **54% of educators indicating they do not have an emergency rainy-day fund**. This is nine percentage points higher than that of the public where, on average, 45% of adults do not have an emergency fund.¹⁶

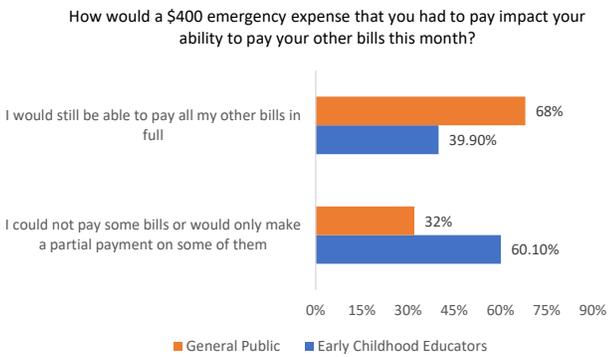
In addition, **60%** of early educators said they would not be able to accommodate or pay their daily expenses with a surprise \$400 expense.

This is in stark contrast to the public, which reported that only 32% would be unable to accommodate a surprise \$400 expense.¹⁷ Even more alarming, **44%** of educators reported utilizing a payday or check advanced loan or borrowing money from a family member or friend to cover expenses. In the public, only 1% reported utilizing a payday or check advance loan and 8% reported borrowing money from a friend or family member.

Graph 6. Early Childhood Educators Less Likely to Have Savings Compared to Public

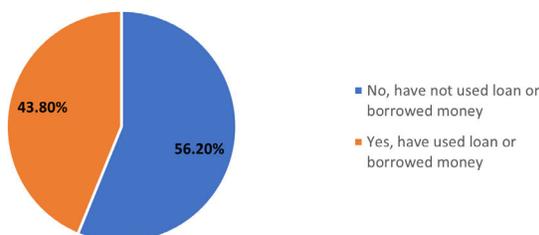


Graph 7. Early Childhood Educators Can't Afford Surprise Expenses Compared to Public



Graph 8. Almost Half of Educators Took a Loan or Borrowed to Cover Expenses

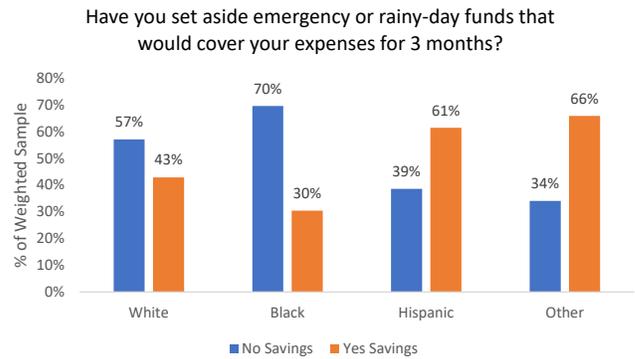
In the past six months, have you had to use a payday loan, deposit advance, or borrowed money from friends or family to cover an expense?



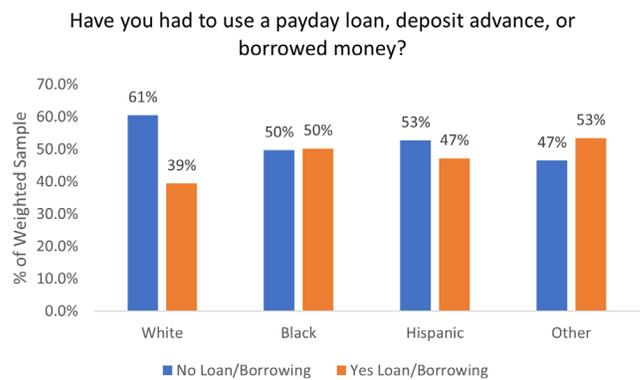
Black educators were 12 percentage points more likely to not have a rainy-day fund compared to their white counterparts.

Hispanic educators and individuals in the “other” category, like Asian and multiracial educators, were more likely to have savings. Forty-four percent of the respondents indicated that they used a payday loan or borrowed money from friends and family in the past six months to cover basic expenses. Black educators were 11 percentage points more likely to use a payday loan or borrow money from a friend in the past six months.

Graph 9. Saving for the Future is a Challenge for Early Educators



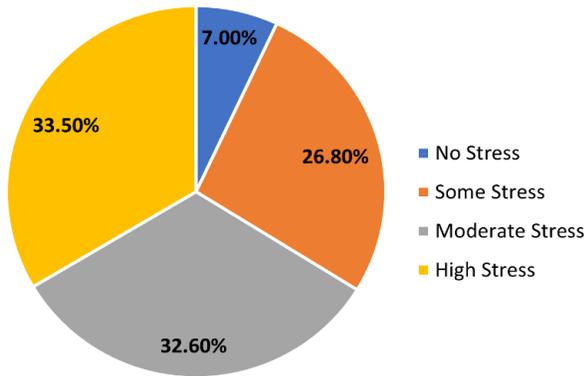
Graph 10. Educators of Color Borrow Money at Higher Rate Than White Educators



The finances of the early childhood workforce affect their mental health, with Graph 12 showing that most educators feel stressed about their finances and 29% reporting that they worry about their finances on a daily basis. This is alarming especially since polls of the general public show **66% report that they feel significant or somewhat significant stress as it relates to their finances.**¹⁸

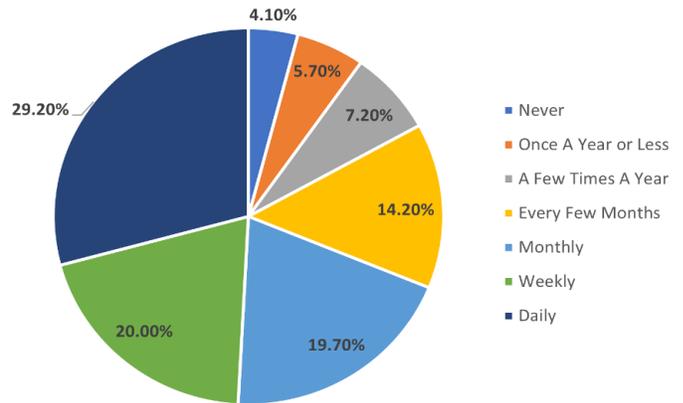
Graph 11. Almost All Educators Feel Some Level of Stress About Their Finances

How much stress, if any, do your finances cause you?



Graph 12. Early Childhood Educators Worry About Their Finances Frequently

How often do you worry about your finances?



Conclusion

The early childhood education sector in Pennsylvania is on the brink of a breakdown. Almost 50% of responding early childhood educators report being unsure or intending to not be working in their jobs in five years. Data show that the sector is poised to lose degree-credentialed educators. The reasons behind these bleak statistics are made clear in the wage analysis – early childhood educators are not earning enough to keep up with the cost-of-living in their geographic regions. This affects their ability to save for the future and meet surprise expenses, leading to high levels of stress and worry.

There is reason to be deeply concerned about the quality of early childhood programming that children will receive if this workforce crisis continues. The findings of this report indicate the need for additional investments in the early childhood workforce, for the sake of our economy and, especially, the sake of our youngest children. Early childhood education providers are unable to raise tuition prices for their parents any more to raise the salaries of their staff. Public investment is the only pathway forward to prevent the sector from a collapse.



Appendix

Appendix 1

Table A. Median Earnings Comparison to Cost-of-Living by County, 2021 Q2

	Median Quarterly Earnings (2021_Q2)	Estimated Full-Time Hourly Rate	Estimated Annual Earnings	Cost of Living ¹	Share of Cost of Living
Adams County	\$6,279	\$12.08	\$25,116	\$33,987	74%
Allegheny County	\$6,911	\$13.29	\$27,644	\$34,258	81%
Armstrong County	\$4,217	\$8.11	\$16,868	\$31,138	54%
Beaver County	\$5,041	\$9.69	\$20,164	\$34,258	59%
Bedford County	\$4,466	\$8.59	\$17,864	\$32,011	56%
Berks County	\$5,794	\$11.14	\$23,176	\$32,906	70%
Blair County	\$5,280	\$10.15	\$21,120	\$32,074	66%
Bradford County	\$5,618	\$10.80	\$22,472	\$32,427	69%
Bucks County	\$6,400	\$12.31	\$25,600	\$37,170	69%
Butler County	\$6,489	\$12.48	\$25,956	\$34,258	76%
Cambria County	\$4,331	\$8.33	\$17,322	\$31,283	55%
Cameron County	\$5,069	\$9.75	\$20,276	\$31,491	64%
Carbon County	\$4,480	\$8.62	\$17,920	\$35,422	51%
Centre County	\$6,406	\$12.32	\$25,624	\$36,629	70%
Chester County	\$7,061	\$13.58	\$28,242	\$37,170	76%
Clarion County	\$4,063	\$7.81	\$16,250	\$32,677	50%
Clearfield County	\$4,057	\$7.80	\$16,228	\$31,096	52%
Clinton County	\$4,804	\$9.24	\$19,216	\$31,408	61%
Columbia County	\$4,941	\$9.50	\$19,764	\$34,050	58%
Crawford County	\$5,090	\$9.79	\$20,358	\$31,034	66%
Cumberland County	\$6,350	\$12.21	\$25,400	\$33,280	76%
Dauphin County	\$6,766	\$13.01	\$27,064	\$33,280	81%
Delaware County	\$6,727	\$12.94	\$26,908	\$37,170	72%
Elk County	\$3,852	\$7.41	\$15,408	\$30,576	50%
Erie County	\$5,661	\$10.89	\$22,644	\$32,843	69%
Fayette County	\$4,339	\$8.34	\$17,356	\$34,258	51%
Forest County	N/A	N/A	N/A	\$31,491	
Franklin County	\$4,973	\$9.56	\$19,892	\$33,218	60%
Fulton County	\$6,081	\$11.69	\$24,322	\$31,491	77%
Greene County	\$3,990	\$7.67	\$15,960	\$32,802	49%
Huntingdon County	\$4,736	\$9.11	\$18,944	\$32,011	59%

	Median Quarterly Earnings (2021_Q2)	Estimated Full-Time Hourly Rate	Estimated Annual Earnings	Cost of Living ¹	Share of Cost of Living
Indiana County	\$5,585	\$10.74	\$22,340	\$32,760	68%
Jefferson County	\$4,030	\$7.75	\$16,120	\$31,928	50%
Juniata County	N/A	N/A	N/A	\$30,576	
Lackawanna County	\$6,063	\$11.66	\$24,252	\$32,323	75%
Lancaster County	\$6,780	\$13.04	\$27,120	\$33,779	80%
Lawrence County	\$5,407	\$10.40	\$21,628	\$31,138	69%
Lebanon County	\$7,278	\$14.00	\$29,110	\$34,216	85%
Lehigh County	\$6,180	\$11.88	\$24,720	\$35,422	70%
Luzerne County	\$5,857	\$11.26	\$23,428	\$32,323	72%
Lycoming County	\$5,638	\$10.84	\$22,552	\$33,779	67%
McKean County	\$4,603	\$8.85	\$18,412	\$31,637	58%
Mercer County	\$4,499	\$8.65	\$17,996	\$31,741	57%
Mifflin County	\$6,210	\$11.94	\$24,840	\$31,242	80%
Monroe County	\$5,636	\$10.84	\$22,544	\$35,984	63%
Montgomery County	\$7,460	\$14.35	\$29,838	\$37,170	80%
Montour County	\$6,316	\$12.15	\$25,264	\$33,821	75%
Northampton County	\$6,158	\$11.84	\$24,632	\$35,422	70%
Northumberland County	\$4,908	\$9.44	\$19,632	\$30,826	64%
Perry County	\$4,384	\$8.43	\$17,534	\$33,280	53%
Philadelphia County	\$7,471	\$14.37	\$29,884	\$37,170	80%
Pike County	\$5,870	\$11.29	\$23,478	\$39,270	60%
Potter County	N/A	N/A	N/A	\$31,678	
Schuylkill County	\$5,060	\$9.73	\$20,238	\$32,074	63%
Snyder County	\$6,402	\$12.31	\$25,608	\$32,594	79%
Somerset County	\$4,123	\$7.93	\$16,490	\$32,427	51%
Sullivan County	N/A	N/A	N/A	\$31,491	
Susquehanna County	\$5,097	\$9.80	\$20,388	\$31,138	65%
Tioga County	\$5,099	\$9.81	\$20,396	\$31,200	65%
Union County	\$7,830	\$15.06	\$31,320	\$32,261	97%
Venango County	\$6,130	\$11.79	\$24,520	\$31,741	77%
Warren County	\$4,307	\$8.28	\$17,228	\$32,323	53%
Washington County	\$5,812	\$11.18	\$23,246	\$34,258	68%
Wayne County	\$5,082	\$9.77	\$20,328	\$33,426	61%
Westmoreland County	\$5,428	\$10.44	\$21,712	\$34,258	63%
Wyoming County	\$5,029	\$9.67	\$20,116	\$32,323	62%
York County	\$6,263	\$12.04	\$25,050	\$33,093	76%

Share of Cost-of-Living	Color
Over 86%	
81% to 85%	
76% to 80%	
61% to 75%	
56% to 60%	
50% to 55%	
N/A	

Appendix 2

The primary demographic data source for the wage analysis came from the Professional Development Registry (PD Registry) owned by the Office of Child Development and Early Learning (OCDEL), which collects information about the early childhood workforce for the purposes of tracking professional development. This dataset includes workers from all types of early childhood settings, including child care settings but also Pre-K Counts and Head Start programs. This data also includes both programs that are center-based and home-based, however due to data suppression and the nature of the wages captured by the Department of Labor and Industry, home-based providers represent a very small sample of this dataset.

Recently the PD Registry was an essential tool used to identify and give out grants that were funded by pandemic relief aid such as the American Rescue Plan (ARP). This increased participation in the PD registry as it required the workforce to create profiles on the registry. We believe the PD Registry to be the only source of data available on the early childhood workforce in Pennsylvania, although by no means is it a perfect record due to the self-reported nature of most of the data. For example, while certain demographic information such as race was mandated and allowed analysis to be done by race, Hispanic ethnicity was not mandated, resulting in a large portion of the sample missing their Hispanic demographic information. Despite these shortfalls, the usage of the PD Registry in a study like this is unprecedented, giving us insight into a workforce in ways we had not been able to do before.

Our analysis relied on quarterly earnings data from individuals in licensed ECE programs between the second quarter of 2021 (April – June) and the first quarter of 2022 (January – March). Wage data were provided by the Pennsylvania Department of Labor and Industry (L & I), which is responsible for managing the Commonwealth’s unemployment insurance program. As part of Pennsylvania’s unemployment insurance program, L & I collects wage information from employers across the state for all workers that qualify for unemployment insurance.

Using name and social security numbers, L & I’s wage information was matched with worker characteristics from OCDEL’s PD Registry, a compilation of self-reported personal and programmatic data that OCDEL collects from individuals working in licensed ECE programs around the Commonwealth. The PD Registry contains a substantial set of self-reported information about educators such as their race, ethnicity, education level, job

title, and certifications. OCDEL worked to combine Registry data with programmatic information about the specific ECE site where individuals were employed (e.g., programs’ STAR level, geographic location, and center vs. home-based).

Estimated Annual and Hourly Earnings

To make these data more interpretable and help enable comparisons to other relevant statistics, we used quarterly earnings to estimate annual earnings and hourly pay rates. Annual earnings described in this report were calculated by summing median quarterly earnings across each four quarters included in our data.

We estimated hourly pay rates by dividing estimated annual earnings by 2,080. These hourly earnings figures represent the imputed hourly compensation for individuals if they had worked full time – 40 hours a week for 52 weeks or 2,080 hours per year. To be clear, we do not know the number of hours worked and so this is an estimate.

Data Processing

Quarterly wage data from L & I contained several outlier cases that may be the result of data entry errors from employers or individuals with short or intermittent employment histories. To clean the data, we removed all cases where individuals were reported to have earned over \$100,000 in a single quarter (the 99.97th percentile) or below \$942.50. This lower threshold is the minimum quarterly wage for a worker earning the state’s minimum wage (\$7.25/hour) working only 130 hours in a single quarter (10 hours per week). These exclusions removed 5,400 records or roughly 1,350 per quarter - approximately 4% of our sample.

To ameliorate privacy concerns related to individual earnings data, L & I suppressed categories of records with fewer than six unique cases. For example, if our dataset only contained three white teachers in Forest County in a STAR 3 program with a High School Diploma, all three records would be suppressed. Although we were unable to analyze individual records for these cases, L & I was able to provide statewide medians for individual groups (e.g., all teachers, all educators in Forest County).

To reduce the amount of suppression, it was necessary to aggregate and combine certain individual characteristics. For example, individuals in ECE programs with a STAR 1 rating and individuals in programs with a STAR 2 rating were combined into a single group, and individual counties were grouped into their Early Learning Resource Center (ELRC) regions to reduce the need for data suppression.

We worked to develop groupings that would balance privacy and with the clarity of our data, but some compromises were necessary. For example, due to data limitations, only non-Hispanic Black, non-Hispanic white, and Hispanic individuals were identified in this analysis. Individuals identifying, for example, as Asian, American Indian, multiracial or another race were grouped together.

Of the 45,001 educators in Q2 2021, for example, L&I suppressed 4,946 records due to privacy concerns and was able to match 31,007 records with earnings data. A further 1,221 matched records with wage data were dropped during the data cleaning process due to issues with reported earnings.

The table below summarizes the number of records analyzed in our analysis in each quarter between Q2-2021 and Q1-2022.

Table B. Summary of Records Analyzed in Each Quarter Between Q2-201 and Q1-2022

	Pre-Suppression Records	Post-Suppression Records	Records Matched with Earnings Data	Matched Records with Valid Earnings
Quarter 2, 2021 (Apr. – Jun.)	45,001	40,055	31,007	29,786
Quarter 3, 2021 (Jul. – Sep.)	48,254	43,204	33,570	31,957
Quarter 4, 2021 (Oct. – Dec.)	47,007	42,014	32,821	31,653
Quarter 1, 2022 (Jan. – Mar.)	48,558	43,453	33,895	32,497
Total	188,820	168,726	131,293	125,893

Data Limitations

Unemployment insurance records have been used to study compensation and pay across many different sectors and industries. These data provide one of most robust and complete sets of information about how and what individuals are paid but have several important limitations.

First, not all employees are eligible for unemployment insurance. Notably, self-employed individuals and workers paid as independent contractors or on 1099s are not covered by the state’s unemployment insurance system, and therefore would be missing from our data. In the ECE industry, many home-based ECE providers are classified as self-employed, and therefore are not included in our analysis.

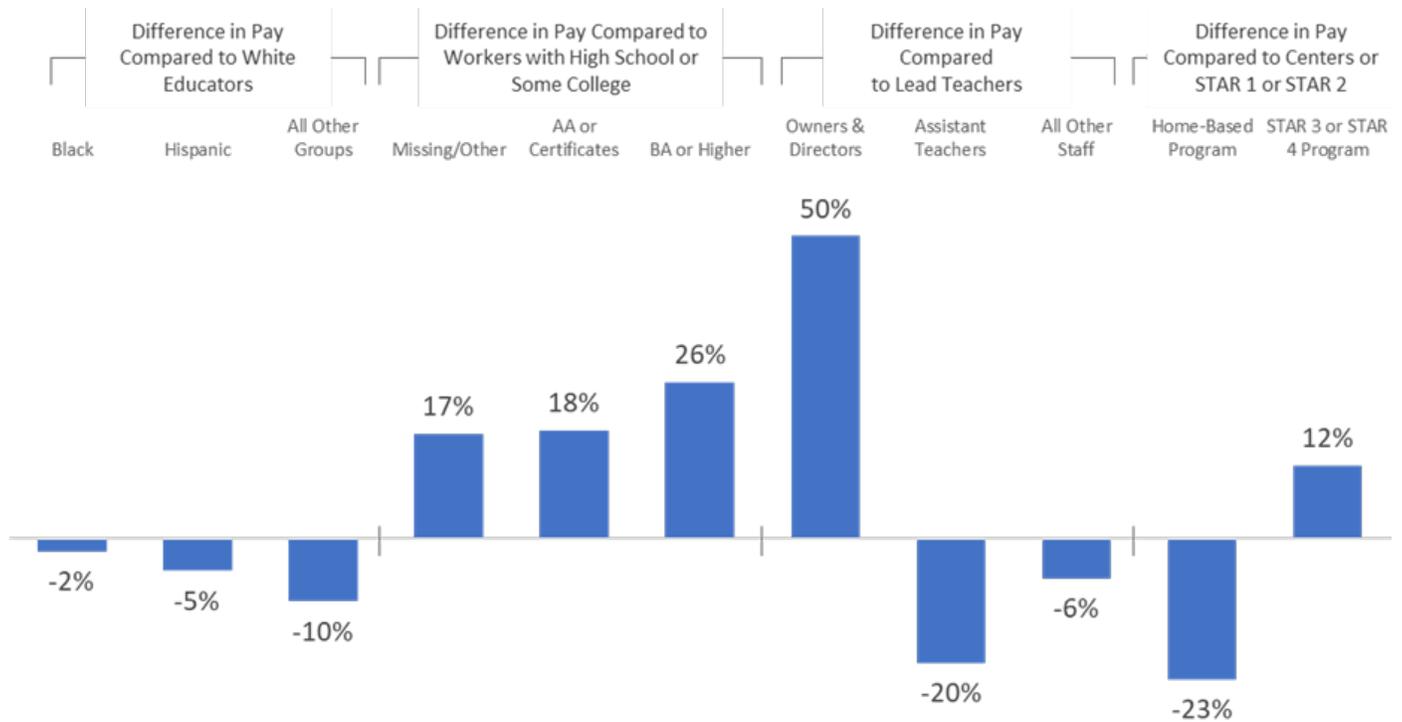
Second, L & I data report aggregate quarterly wages, but not the number of hours worked. This makes it difficult to distinguish between workers employed full-time and part-time, and workers holding multiple jobs simultaneously. To offset these challenges, we aggregated wages across all forms of employment within quarters to report the total earned in each quarter from all forms of eligible employment. In some cases, we estimated hourly wages from quarterly earnings, but these figures should be interpreted with caution.

Regression Analyses

To understand more about the impact of different personal and programmatic characteristics on earnings in the ECE sector, we conducted a regression analysis on the individual earnings records provided by OCDEL and L & I. The model described below used the natural log of earnings for the four quarters between Q2, 2021 and Q1, 2022. The natural log transformation helps correct for skewness in the earnings data and aids with the interpretation of the coefficients, since income is better considered on a multiplicative rather than additive scale.

A full set of controls describing each individuals’ race and ethnicity, job classification, and education level, as well as programmatic factors describing each educator’s employer’s STAR level, program type (home or center based), and ELRC region were included along with fixed effects for each time quarter. Due to concerns with missing data, we did not include indicators for educators holding certifications in the model. Coefficients from the model represent the percentage difference in quarterly earnings associated with each characteristic holding all other factors constant. The figure below summarizes each factor included in the model (excluding geographic and time factors).

Graph A. Summary of Model Coefficients: Impact of Individual and Program Characteristics on Logged Wages



Analytical Approach

Our estimating equation is a regression of individual and programmatic characteristics on logged quarterly earnings.

$$\ln(\text{Earning}_i) = \beta_0 + \beta_1 \text{RaceEth}_1 + \beta_2 \text{Edu}_i + \beta_3 \text{Job Title}_i + \beta_4 \text{Prog Type}_i + \beta_5 \text{QRIS}_i + \beta_6 \text{ELRC Region}_i + \beta_7 \text{Quarter}_i + e_i$$

RaceEth1 is vector of indicators for each educator’s self-reported race and ethnicity. Responses were grouped into four categories: Non-Hispanic white (excluded), Non-Hispanic Black, Hispanic, and All Other Races/Multiracial. Edu1 is vector of indicators for each educator’s level of education. Responses were grouped into five groups: High School Diploma or Some College (excluded), Associate’s or Approved Credential/Certification, Bachelor’s Degree or Higher, and Other or Missing Education. Prog Type_i is an indicator for individuals working in a Home-Based program or center based program (excluded). QRIS_i is an indicator for individuals working in a program with a STAR 1/STAR 2 rating or STAR 3/STAR 4 rating (excluded). ELRC Region_i is a vector indicating the ELRC region in which the individual was employed (ELRC Region 18: Philadelphia, is excluded).

Quarter_i represents the quarter in which earnings were calculated (Q2, 2021 was excluded). Table C on the next page describes the coefficients and standard errors from the model above. All inputs were statistically significant at the 0.05 level, with the exception of Q1, 2021.



Table C. Regression Output (Adjusted R2 = 0.1999)

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	8.692	0.007	1184.892	0.00000
Race/Eth: Non-Hispanic Black	-0.018	0.005	-3.223	0.00127
Race/Eth: Hispanic	-0.052	0.007	-7.087	0.00000
Race/Eth: All Other Races/Multiracial	-0.102	0.005	-19.911	< 0.00000
Edu: Associate's or Credential	0.180	0.006	29.538	< 0.00000
Edu: Bachelor's or Higher	0.259	0.005	52.459	< 0.00000
Edu: Other or Missing Education	0.174	0.004	40.521	< 0.00000
Job Title: Assistant Teachers	-0.205	0.004	-48.946	< 0.00000
Job Title: Owners or Directors	0.500	0.006	85.289	< 0.00000
Job Title: All Other Staff	-0.065	0.005	-13.972	< 0.00000
Prog Type: Home-Based Provider	-0.231	0.015	-15.343	< 0.00000
QRIS: STAR 3 or STAR 4	0.121	0.003	36.195	< 0.00000
Region: ELRC 15	-0.062	0.009	-6.824	0.00000
Region: ELRC 3	-0.197	0.010	-19.619	< 0.00000
Region: ELRC 4	-0.220	0.009	-23.192	< 0.00000
Region: ELRC 16	-0.098	0.008	-11.878	< 0.00000
Region: ELRC 12	-0.200	0.010	-19.304	< 0.00000
Region: ELRC 6	-0.251	0.010	-24.153	< 0.00000
Region: ELRC 8	-0.155	0.012	-12.701	< 0.00000
Region: ELRC 1	-0.195	0.010	-19.674	< 0.00000
Region: ELRC 19	-0.043	0.009	-4.998	0.00000
Region: ELRC 5	-0.047	0.007	-6.956	0.00000
Region: ELRC Group A	-0.239	0.008	-28.919	< 0.00000
Region: ELRC Group B	-0.072	0.006	-11.208	< 0.00000
Region: ELRC 13	-0.146	0.010	-14.749	< 0.00000
Region: ELRC 17	-0.016	0.007	-2.294	0.02181
Region: ELRC 14	-0.090	0.008	-11.219	< 0.00000
Quarter: Q3, 2021	-0.046	0.005	-9.916	< 0.00000
Quarter: Q4, 2021	0.129	0.005	27.959	< 0.00000
Quarter: Q1, 2022	0.004	0.005	0.809	0.41873

To help illustrate the estimates in the model work in practice, the table below shows the predicted annual earnings for a Black, white, and Hispanic lead teacher with an associate’s degree, working in a STAR 3 or STAR 4 center in Philadelphia (ELRC Region 18), Allegheny County (ELRC Region 5), Montgomery County (ELRC Region 17), and ELRC region B, which included York, Lancaster, Cumberland Dauphin, Lebanon, Perry, and Adams counties.



Table D. Predicted Earnings Among Similar Teachers by Race*

	White	Black	Hispanic
ELRC Region 5: Allegheny County	\$32,441	\$31,863	\$30,798
ELRC Region 17: Montgomery County	\$31,451	\$30,890	\$29,858
ELRC Region 18: Philadelphia County	\$32,965	\$32,377	\$31,294
ELRC Region B: York, Lancaster, Cumberland, Dauphin, Lebanon, Perry, and Adams Counties	\$30,675	\$30,128	\$29,120

*Predicted earnings assume lead teachers hold an associate’s degree and work in STAR 3 or STAR 4 centers.

Appendix 3

Survey Sample and Weights

The teacher survey was fielded statewide in September 2022. A network of child care advocates and stakeholders helped publicize the survey across the state and identify and encourage teachers to complete the questionnaire. After cleaning the data and removing incomplete and duplicate or inaccurate responses, 3,429 unique responses remained.

Responses included teachers from every county in the Commonwealth. Just over half of respondents came from urban counties (54%) while just under half (45%) came from rural counties. Although the high number of responses from ECE teachers in rural counties is helpful for ensuring a wide representation of respondents, wage and employment data from the Pennsylvania Department of Labor and Industry suggest that just nearly 80% of the state’s ECE employment is in urban counties. To ensure the averages presented in this document align with the actual distribution of workers across Pennsylvania, we developed a set of statistical weights to adjust for these differences. Weights were constructed to align our results with the employment figures reported by the Pennsylvania Department of Labor and Industry for 2021 in each of the state’s Early Learning Resource Centers.

Data Cleaning and Exclusions

In total we received 7,907 responses to the survey. A high number of these responses (roughly 56%) were discarded due to incompleteness or errors that made the results difficult to analyze. After filtering these records, we were left with a sample of 3,429 unique responses. The table below summarizes the characteristics of the 4,478 responses that were dropped from the initial sample.

	Total	Share of Total
Responses Analyzed	3,429	43%
Total Discarded Responses	4,478	56%
Respondent Answered Less than 75% of Survey	120	2%
Did Not Work in ECE	459	6%
Missing Geographic Information	360	5%
Duplicate Responses	1,124	14%
Suspicious Responses	2,396	30%
Total Survey Responses	7,907	100%

Survey Sample Characteristics

Among discarded responses, roughly 6% were discarded because the respondent indicated that they did not work as a teacher or did not work with children under the age of six. An additional 5% were dropped because the respondent did not provide information about the county where their place of work was located or because they indicated that they worked out of state. Because results were weighted by place of work, these responses could not be analyzed.

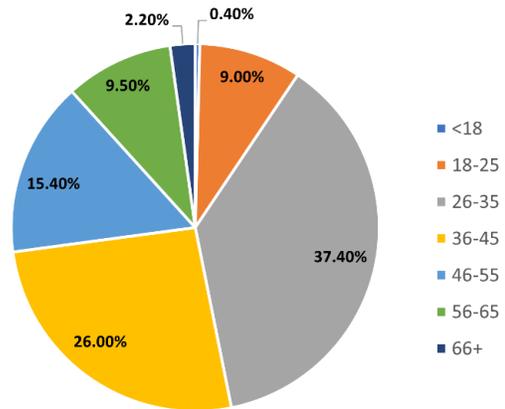
The largest number of discarded responses were discarded because they were identified as duplicates (14%) or because the answers provided did not appear accurate (30%). Duplicate responses were identified by the Qualtrics platform, which tracks users' browser information to flag respondents who fill out multiple surveys. A small number of additional duplicate responses were identified using email addresses provided by respondents who entered the survey's optional raffle.

We also analyzed records to identify surveys with suspicious or inconsistent responses. This analysis identified respondents who entered gibberish or duplicated information into the survey's open-ended responses. A large number of responses identified in this way appeared to select the first option on every survey question or enter information that was highly suspicious. The table below summarizes the demographic, and program information for duplicate or suspicious responses identified on the survey.

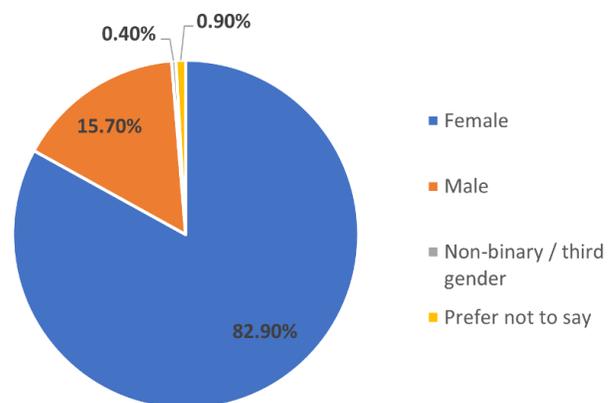
Compared with the responses analyzed in this document, a very high proportion of dropped responses indicated they were male, American Indian, Asian or Pacific Islander, or taught in home-based programs. Information for the Pennsylvania Department of Labor and Industry and census records suggest that receiving this number of responses from male, American Indian, and Asian/Pacific Islanders that work ECE would be highly unlikely.

	Duplicate Responses	Suspicious Response	Analyzed Responses
N	1,124	2,396	3,429
Share Male	19%	33%	20%
Share American Indian	17%	13%	6%
Share Asian Pacific Islander	10%	9%	5%
Share in Home-base Programs	31%	37%	20%

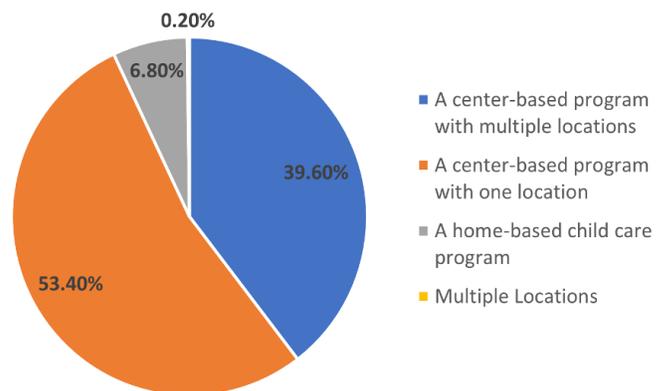
Graph B. Survey Respondents Age



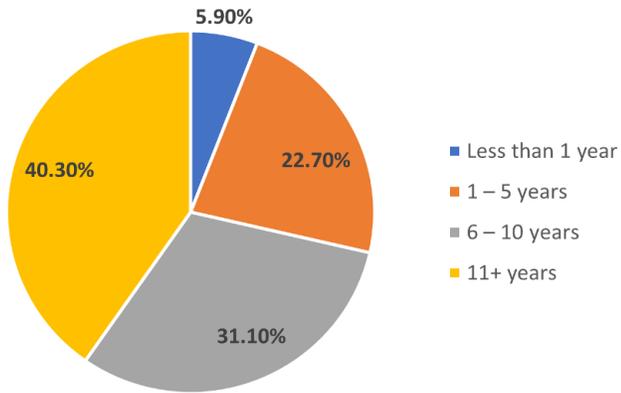
Graph C. Survey Respondents' Gender



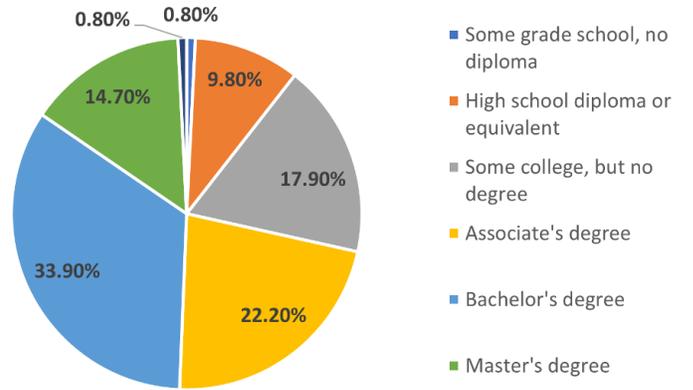
Graph D. Survey Respondents' Type of Early Childhood Program



Graph E. Survey Respondents' Career Tenure



Graph F. Survey Respondents' Education Attainment



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