

# Cost of Quality Phase II





# Cost of Quality Phase II Licensed Centers

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# Executive Summary

The Department of Early Learning (DEL) oversees the Cost of Quality project as a part of DEL's obligation to create an effective and continuous early learning system for children and families in Washington state. DEL designed Phase II with a mission to understand the costs of operating a child care center and the related costs associated with Early Achievers. As Washington's Quality Rating and Improvement System, Early Achievers offers support to early learning professionals to continuously improve their programs. It also provides quality ratings, on a scale of 1 to 5, to communicate quality to parents.

Researchers achieved a 70 percent response rate on a web survey sent to a sample of approximately 400 childcare centers. Researchers report the major findings below.

## Center Characteristics

Researchers looked to see if characteristics of centers have a relationship with Early Achievers quality level. While these variables do not account for costs, several are estimators of centers' quality levels. These include:

- The amount of indoor and outdoor space per child appears to have a positive relationship with quality.
- The longer a center has operated, the higher their expected quality level, especially at Levels 2 through 4.
- Centers with diversity are more likely to have a higher rating, all else held constant. This is statistically significant at the .10 level. Researchers define this variable as some center staff with ethnicity or race other than white, or a primary language other than English. This effect may be due to the benefit of cultural exposure or the involvement of the community.

## Staff

Researchers found several interesting relationships between staff variables and Early Achievers quality level. These include:

- Wages for lead and assistant teachers increase as quality level increases in Regions 1 and 2. This means there was sufficient data to provide evidence for the trend in these regions. This is statistically significant at the .05 level.
- Lower assistant teacher turnover corresponds with higher quality levels. This is statistically significant at the .05 level.
- Higher wages for directors and program supervisors in some regions correspond with higher quality levels. This is statistically significant at the .05 level.
- Centers are more likely to require any level of college for assistant teachers as quality level increases. This is statistically significant at the .10 level.

High-quality centers offer positive job experiences for their employees. They also have higher standards of education for their staff. This may result in higher wages and less turnover.

## Enrollment Statistics

Researchers also included enrollment statistics in data analysis. Researchers made the following observations about variables:

- As the number of children served by a center increases, quality level can be expected to increase, all else held constant. This is statistically significant at the .10 level. This may be due to large centers having more resources, or economies of scale.
- Centers appear to have a lower quality level if they serve school age children. This may be due to school age children requiring a lower staffing ratio, meaning centers with fewer resources may provide care for this age group. To ensure quality across the continuum of birth through elementary school, Washington is investing in expanded learning opportunities for school-age programs that build on the birth to five years quality rating and improvement system.

- Centers of higher quality levels have a greater likelihood of caring for infants. This is statistically significant at the .10 level. Caring for infants requires higher staffing ratios than other age groups. Thus, it may be that more established or well-endowed centers will provide care for infants.

## Costs and Revenue

Business models for centers can vary amongst quality levels. These differences include:

- Higher-quality centers are more likely to receive donations or in-kind goods. This is statistically significant at the .05 level. This may be because centers with a reputation of quality attract donations. Or, these donations allow centers to spend revenue on costs that affect quality more. Additionally, it may be a signal for community involvement with the center.
- Level 2 centers spend more on variable Early Achievers costs. However, Early Achievers costs represent a small part of their budget when compared to high-quality centers.
- Levels 4 and 5 have a large portion of their budgets dedicated to monthly investment in Early Achievers.
- Level 3 centers spend slightly more per month on Early Achievers when compared to Level 2 centers. This suggests that with a modest additional investment, Level 2 centers might move to Level 3.
- Centers that have not yet rated have a large amount of their budget going towards Early Achievers, a possible sign that these centers are preparing for evaluation.

For rated centers, those that spend more in areas related to Early Achievers appear to have higher quality levels. Centers that DEL has not yet rated have large Early Achievers costs, suggesting they are preparing to rate.

## Other Insights

This study has shown the value of the Early Achievers framework and the investments made by federal and state government over time. It has also shown that private tuition costs are not significant indicators of quality. Thus, private pay tuition rates are not market signals of quality. This means that a higher tuition rate does not equal a higher quality of childcare. This makes it difficult for parents to know the quality of the care they are buying. Washington therefore has a role to play to promote transparency and economic efficiency while funding the cost of quality. Early Achievers does this with the childcare market by ranking the quality level of the provider for parents to see.



# Introduction

## Child Care in Washington State

Approximately 90,000 children are born in the state of Washington every year. For the first five years of life, a child's brain is developing faster than at any other age. Every interaction is formative and may affect them for the rest of their lives. High-quality early learning positively contributes to language, literacy, and mathematics skills, with the largest effect on children living in or near poverty<sup>1</sup>. Other positive benefits of high-quality early learning include:

- Improved social competence,
- Increased high school graduation rates,
- Higher college attendance,
- More full-time employment in adulthood, and
- Better health outcomes in childhood, adolescence, and adulthood<sup>2</sup>.

High-quality early learning programs are important for children and the state.

Ensuring children have access to high-quality care is essential.

## The Department of Early Learning

The Washington State Legislature founded the Department of Early Learning (DEL) in 2006. DEL's mission is that children start kindergarten healthy, capable, and confident in their ability to learn and succeed. DEL offers voluntary, comprehensive, and high-quality programs and support to families and early learning professionals.

DEL believes that effective support is vital for all children to develop and transition from early childhood to early elementary. Over 350 employees work in 16 field offices around the state or the state office in Olympia.

## Center Child Care Regions

Figure 1: Washington Child Care Regions



Researchers used subsidy regions in this report, as the findings are intended to inform subsidy programs.



## Early Achievers

Washington's Quality Rating and Improvement System, known as Early Achievers, offers support to early learning professionals to continuously improve their programs. A Race to the Top Early Learning Challenge grant in 2011 helped establish DEL's quality improvement efforts<sup>3</sup> and an additional investment by the Legislature in 2015 is increasing child care quality of more providers than ever before. Early Achievers offers:

- Resources (such as training, coaching, and incentives) to child care providers that help them offer high-quality care.
- Information on quality to help parents and caregivers select care or programs that fit their needs.

1. Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W. T., Ludwig, J., Magnuson, K., Phillips, D., & Zaslow, M (October, 2013) "Investing in Our Future: The Evidence Base on Preschool," Society for Research in Child Development, Washington, D.C. Foundation For Child Development. October 28, 2016. Accessed November 28, 2017.  
2. "Strategic plan 2015-2018." Del.wa.gov. September 2014.  
3. "Early Achievers standards validation study." Department of Early Learning. May 2016.

- Children with high-quality early learning experiences that help them develop the skills they need to be successful in school and life<sup>4</sup>.

DEL developed the Early Achievers framework in collaboration with child care providers across the state. All licensed providers who receive state subsidy payments for non-school age children must enroll in Early Achievers and achieve a Level 3 rating within a set timeframe in order to maintain subsidy eligibility. Early Achievers promotes higher levels of quality in early care and education by establishing five quality levels for provider participants<sup>5</sup>:

- **Level 1: The Foundation of Quality.** Level 1 is licensing or certification that includes all child care centers and family child care homes, military, tribal, Head Start, ECEAP, and other state funded programs. These facilities must meet health and safety standards set by licensing or other certification.
- **Level 2: Professional Growth and Facility Management.** Level 2 activities ensure that program leaders understand Early Achievers, program standards, child outcomes, and school readiness goals of the system and are also participating in quality improvement in partnership with coaching support and incentives. Facilities must complete all Level 2 activities to be Early Achievers participants. Facilities may also be rated Level 2, depending on points achieved in the Quality Standards. Facilities that have rated Level 2 are referenced in this report.
- **Level 3: Demonstrating High-Quality.** Level 3 is achieving high-quality in the Quality Standards and is the catalyst for Continuous Quality Improvement.
- **Level 4: Thriving in High-Quality.** Level 4 builds on Level 3 and provides expanded opportunities for family engagement and school readiness. Providers have a focus on preparing children for kindergarten, supporting overall development of individual children, and including parents in their child's learning and development plan.
- **Level 5: Excelling in High-Quality –** Level 5 builds on Level 4 through strong partnerships with families, areas of specialization, and highly qualified teachers with ECE degrees. Providers demonstrate consistent best practices associated with positive child outcomes for all and include a deep understanding of how to individualize instruction and support for every child and family. This is the hardest level to qualify for. Only one Level 5 provider responded to the survey.

Figure 2: Early Achievers Quality Levels



4. ["Early Achievers participant operating guidelines." Del.wa.gov. September 2017.](#)

5. ["Early Achievers, Washington's quality rating and improvement system standards." Del.wa.gov. July 16, 2017.](#)

By measuring quality, DEL can improve child care standards beyond basic health and safety, focus on teacher-child interactions, and foster supportive environments. Providers meet the Early Achievers levels by completing milestones and earning points through onsite evaluations. DEL sets the policy for Early Achievers, works with implementing partners, and uses successes and lessons learned to adapt and improve policy.

## The Cost of Quality Research Series

The Cost of Quality series is part of DEL's obligation to review and improve child care programs. The series consists of surveys and analyses of business models of different providers. The series currently has three planned phases:

- Phase I was a proof-of-concept phase. It focused on ten contractors in the Early Childhood Education and Assistance Program (ECEAP). DEL completed the interview process and collection of standard budget templates in 2016. The interviews were qualitative and open-ended to inform future projects.
- Phase II is the subject of this report. The project began in the summer of 2017. Researchers used a web-based survey to gather enrollment and operating cost information. The subject of Phase II is licensed child care centers.
- Phase III will use a web-based survey of licensed family homes, which DEL will conduct in 2018.

DEL planned the research series so that experience from each stage informs future actions. As such, the researchers identify successes, challenges, and recommendations in this report. Researchers gathered input from child care centers before survey deployment. Centers and stakeholders also assisted with interpretation of the survey responses.

The intent of Phase II is to better understand the operating costs of child care facilities and the costs associated with Early Achievers. By identifying costs, DEL can identify the investment needed for each level of Early Achievers. DEL intends for Phase II to inform budget decisions by drawing correlations between cost drivers at child care centers and higher levels of quality. Focused investments to capitalize on those correlations could take the form of increased subsidy rates, higher quality improvement awards, greater tiered reimbursement awards, or targeted scholarships, among other opportunities.

To determine these correlations, DEL created a survey to ascertain the typical costs for centers to maintain their Early Achievers quality level in addition to total costs and revenue, continuous quality improvement using the Early Achievers framework, and indirect benefits (private tuition rate, capacity, etc.). DEL examined differences in costs and revenue between providers at different quality levels. These findings will highlight areas that may be opportune for increased funding and assistance to enhance the quality of all child care centers in the state.

## Methodology

### Survey

In April 2017, the Washington State Institutional Review Board granted the project an exempt determination request, due to the project's classification as program evaluation. Researchers linked survey responses to information from DEL's databases. After linking, researchers de-identified the data collected to the greatest extent possible. This was to avoid concerns around disclosure of proprietary financial information and encourage participation from providers. Researchers destroyed identifiable data after completion of the report.

Researchers used DEL's databases of 2,000



licensed childcare centers to pull a random sample of 450 providers. This sample was higher than necessary for statistical validity, but was necessary to protect against potential duplicates and ensure accurate contact information. Researchers then verified that the quality level distribution was representative of the state. School-age only providers were not included in the sample. After screening the contact information for outdated or duplicate entries, researchers contacted 397 centers for the survey.

The survey was web-based, voluntary, and took about 45 minutes per provider to complete. Many respondents completed the survey over the phone with DEL interviewers. Interviewers then answered the web-survey on behalf of these respondents. The survey included questions about the enrollment, tuition, staffing, and operational costs of each center.

Feedback from the Phase I interviews provided the foundation for the Phase II survey design. Further, DEL engaged the provider community in collecting data by asking them to take part in the design, analysis, and outcome of the research. DEL also included advisory committees in designing the survey language and increasing participation. These committees included the Early Achievers Review Subcommittee and the Early Learning Advisory Council.

DEL sent the first survey invitation email June 20, 2017. This email included a message from the Deputy Director and the survey link. DEL sent reminder emails the following week. At the end of the second week of deployment, follow-up calls began. These calls encouraged the respondents to complete the survey or schedule an interview time. In an interview, the respondent could have assistance in better understanding questions while answering the survey. Beginning in July, interviewers called respondents who did not complete the survey, and they worked to explain questions and recover as many answers as possible. The survey closed on August 21, 2017. After preliminary analysis, interviewers questioned

several respondents about the costs reported. This was to provide more qualitative information and a framework for data analysis.

For a long survey, DEL achieved an impressive response rate of 70%, three responses away from the overall goal of 280. However, only 186 of respondents answered all the questions. Researchers based the sample error on 397 centers from a population of approximately 2,000. Therefore, the margin of error is  $\pm 4.4$  percent at the 95 percent confidence level.



## Analysis

The analysis presented includes exploration of descriptive data, bivariate comparisons, logistic regression models, and cost modeling. Researchers examined the quality levels between centers, but data collection did not allow for analysis based on changes over time. Instead, analysis focuses on differences between centers with different quality levels. The researchers recommend a follow-up study examine changes in centers over time.

Initial descriptive analysis includes averages, percentages, and number of observations for different variables. The researchers conducted bivariate comparisons to look for obvious patterns with quality levels. Researchers used one-way analysis of variance (ANOVA) to test for significant trends in continuous data, chi-squared testing for categorical data, and t-testing when testing the means of two different groups. Researchers conducted analysis using Microsoft Excel, RStudio, and Tableau. Researchers report figures in monthly amounts unless otherwise specified.

The researchers conducted a logistic regression model to determine which variables explained the variation in Early Achievers quality levels. As with the bivariate comparisons, researchers compiled variables using the cleaned survey data. A correlation matrix identified inefficiencies from the model, and researchers noted correlations of .5 or above as concerns. Researchers excluded these variables from the regression to prevent multi-collinearity. To choose between two correlated variables, researchers created simple linear regressions of each. Researchers chose the best model fit based on comparing the Bayesian information criterion (BIC) for each model. Researchers indexed correlated cost variables to preserve their effect in the model. To create an efficient regression model, the researchers removed inefficient estimators when possible. Researchers determined inefficient variables by observing a large and not significant p-value.

Due to the previously mentioned lack of complete responses, researchers report statistics at the .10 significance level. Additionally, researchers removed eight ECEAP-only centers from the regression sample.



## What is a regression?

A regression model is a way of measuring the relationship between variables.

In this instance, researchers used a regression model to measure the relationship between Early Achievers quality level and variables from the survey. For example, a simple regression of teacher salary on quality level will measure how much a dollar increase in teacher hourly wage will affect the expected quality level, holding all other variables constant.

It is important to know that regressions cannot prove what *causes* changes in quality— the model instead describes what is *associated* with quality.

They included centers with an ECEAP classroom in the regression because their business models more closely reflected the larger child care industry. These centers also provided much-needed variation in quality.

Next, the researchers developed a cost model in Excel using the survey data. Researchers created visualizations in Tableau to look for trends and outliers, and converted expenditures into monthly figures. Researchers indexed these to find the monthly variable cost for child care centers, then accounted for revenue the same way, including tuition and donations.

Researchers attempted to determine profit by subtracting the total variable costs from revenue. Profit was negative for some centers, which caused the researchers to consider possible missing variables. They selected a sample of centers for follow-up contact, and interviews revealed that the survey may not capture all kinds of revenue or amounts of in-kind services. This led to the decision by researchers to focus on costs, rather than profit, in these models.

Researchers used regression model residuals to estimate their rating. Once DEL rates these centers, researchers can test these predictions for accuracy.

# Results

Researchers report results in order of statistical validity. Some variables were significant under bivariate analysis, but were not in regression models. This is because hypothesis testing analyzes differences in the population means, and regression analysis isolates the effects of variables. Some variables do not have a significant effect when everything else is held constant, but exhibit a significant trend otherwise.

## Descriptive Data

The descriptive data in this report comes from two sources. The first is regression results that are not significant, and the other is clustering and averages.

While not statistically significant, regression models did return estimates for other variables. Since these are not significant, the effect is not quantified. But, researchers report some of the positive or negative relationships with quality. Researchers intend for these to be areas of further exploration.

### What is statistical significance?

Statistical significance is a measure of certainty of difference. This difference can be between different groups, or the observed versus chance.

For example, a statistically significant variable in our regression means that there is evidence the variable effects quality – it is not just chance.

It is important to know that significance can only *provide evidence* that there is a difference – it cannot prove it.

Different significance levels measure the certainty of difference. A .05 significance level means the researcher is 95 percent confident that the observed difference is real. Typical significance levels are .10, .05, and .001. This report represents statistical significance as .10 level unless otherwise specified.

### Positive relationship with quality:

- Size — the amount of indoor and outdoor space per child appears to have a positive relationship with quality.
- Donations or in kind goods — receiving any amount of donated goods or services. This trend is discussed in *Bivariate Comparisons*.
- Experience — the longer a center has been in operation, the more likely it is to have a higher Early Achievers quality rating. This trend is discussed below.
- Serving infants — this trend is discussed in *Bivariate Comparisons*.
- Higher amount of private tuition — this trend is discussed below.

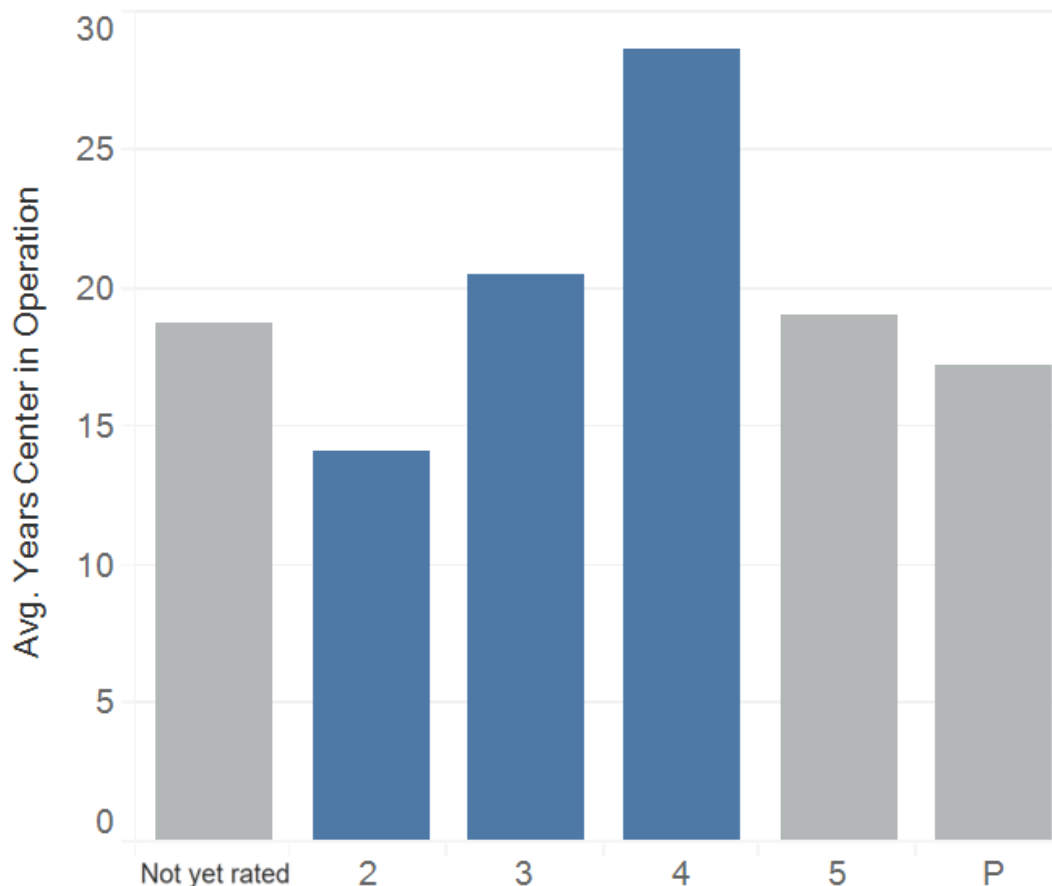
### Negative relationship with quality:

- Teacher turnover — this trend is discussed in *Bivariate Comparisons*.
- Serving school-age children — since this age group requires a low staffing ratio, centers with less experience or resources may opt to care for this age group over others. To remedy this, DEL is operating new programs to help improve the quality and funding of care for this age group, such as the Expanded Learning Opportunities Quality Initiative.



The trend with experience discovered in the regression is quite noticeable between Levels 2 and 4. The effect may be due to the importance of building on institutional knowledge and reputation in improving quality. It also suggests that DEL should expect centers to increase in quality over time. The figure below visualizes this trend for centers at quality Levels 2 through 4. Level 5 has only one observation, and “not yet rated” indicates a center that DEL has not rated but is participating in Early Achievers. P (private) denotes centers that DEL has not rated and are not participating in Early Achievers.

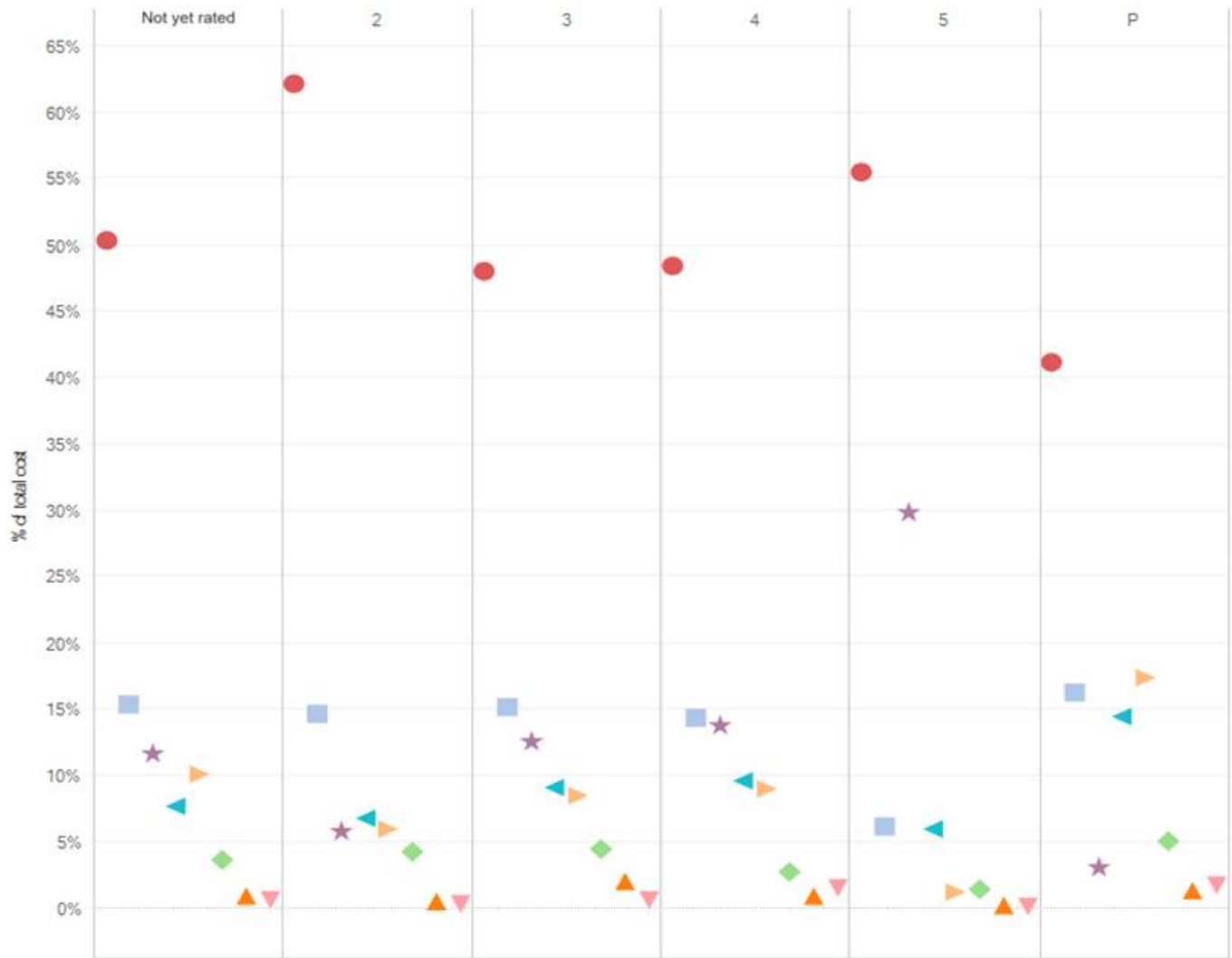
Figure 3: Average Years a Center Has Been in Operation



The identification of the trend in private tuition rates as descriptive (not statistically significant) is also of importance. According to economic theory, the cost of a good or service is a direct signal for quality. Rational consumers value high-quality goods more than low-quality ones. This translates into a higher price paid for high-quality goods. Consumers then can use their budget and quality preferences to select the service that works best for them. But, this market-based approach only works when cost is an indicator of quality. Researchers did not find that private tuition costs are significant indicators of quality. This demonstrates the importance of promoting transparency and economic efficiency in the child care market. If this was an effective market signal, one could expect the corresponding regression coefficient to be significant and large compared to the other variables. The coefficient found here fits neither of those benchmarks. Washington thus has a vital role to play by identifying quality in the child care market. Early Achievers does this by establishing quality levels for the parent or caregiver to see.

The standard operating costs for centers is consistent across Early Achievers quality levels. This means that the percentage values may vary, but the relative order of each type of expenditure did not. Descriptive statistics are in the figure below.

Figure 4: Type of Variable Expenditure by Early Achievers Quality Level



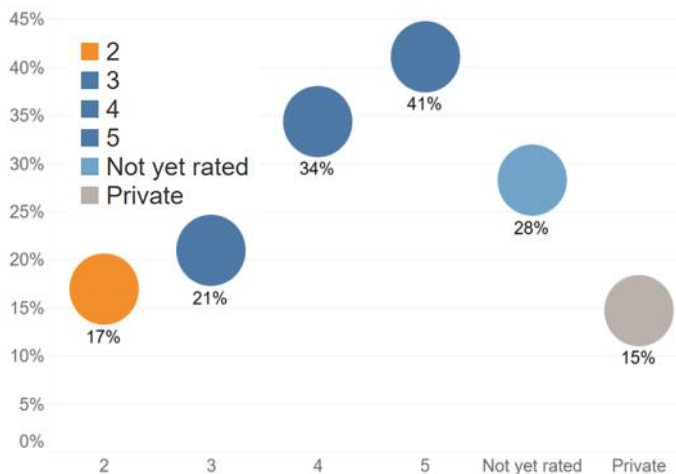
As shown in the illustration above, salaries, first teacher then administrative, make up the bulk of costs for all levels. Unrated and Level 3 centers have similar expenditure percentages. Level 3 is the baseline level for centers. It then follows that as a whole, unrated centers would resemble Level 3. Level 2 has the highest percentage of expenditures for teacher salaries. Level 5 does look different than the other ratings, but as there is only one observed center in this level the differences are not reliable. Altogether, the above figure shows that unrated and Level 3 centers are similar, with the exception of Early Achievers costs and teacher salaries. It also appears that there is a difference in budget priorities between high-quality centers and sites rated at Level 2.



Total costs specific to Early Achievers also demonstrated a pattern, as seen in the figure below. Level 2 providers spend proportionally less of their budget on Early Achievers. But, Figure 9 shows that Level 2 centers spend nominally more than other levels in this area. Together, this means that Level 2 centers spend more money on variable Early Achievers costs, but these expenditures represent a smaller part of their overall budget when compared to high-quality centers. This implies that it is more expensive to operate a Level 2 center. Researchers plan to further investigate this in the future, to see if the costs for Level 2 centers change as they become more established and operate longer.



Figure 5: Early Achievers variable cost as a percentage of total variable cost



Level 3's percentage is slightly larger than Level 2. Since Level 3 is the quality baseline, it suggests that with additional monthly investment, Level 2 centers might increase to 3. Levels 4 and 5 have investment that reflects their high quality. Unrated centers spend a moderate amount of their budget for Early Achievers, a possible sign that they are preparing for evaluation.

## Bivariate Comparisons

Researchers conducted trend analysis between Early Achievers quality rating and center characteristics. They report findings significant at the .10 significance level (unless otherwise specified). Higher quality ratings are associated with:

- Higher teacher salaries (significant at the .05 significance level).
- Lower assistant teacher turnover (significant at the .05 significance level).
- Higher administrative staff salaries in some regions for directors and program supervisors (significant at the .05 significance level).
- A greater likelihood of receiving donations or in-kind goods and services (significant at the .05 significance level). This may be because centers that have a reputation of quality are able to attract donations more than other centers, or these donations allow them to spend tuition revenue on costs that more directly affect quality. Additionally, it may be a signal of community involvement with the center.
- A greater likelihood of caring for infants. Caring for infants requires higher staffing ratios than other age groups. Since this is more difficult and costly, it may be that more established or well-endowed centers will opt to provide care for infants.

Researchers found a positive trend between teacher wages and quality level in Regions 1 and 2. Regions are based on Subsidy Regions, but differ for Clark, Benton, Walla Walla, and Whitman counties to correspond with center payment regions. The figures below show descriptive statistics based on region and quality level. Researchers report regions with statistically significant upward trends with "\*" and the p-value. Cells are shaded darker as wages increase.

Some regions demonstrate statistically significant higher wages with higher levels of quality. But, there was insufficient evidence to determine a positive trend between salary and quality for all regions. Private centers not participating in Early Achievers were excluded from significance testing.

Figure 6: Lead Teacher Wage						
	5	4	3	2	Unrated	Private
<b>Region 1*</b> (0.025)	—	\$18.50	\$12.00	—	\$11.00	\$29.00
<b>Region 2*</b> (0.035)	—	\$15.50	\$12.89	—	\$12.00	\$15.05
<b>Region 3</b>	\$21.00	\$13.94	\$13.53	\$14.38	\$13.39	\$14.17
<b>Region 4</b>	—	\$17.33	\$17.12	\$15.50	\$18.71	\$18.95
<b>Region 5</b>	—	\$11.15	\$13.34	\$12.00	\$12.55	\$31.00
<b>Region 6</b>	—	—	\$14.33	\$11.00	\$12.64	\$18.00
<b>Spokane</b>	—	\$13.11	\$11.93	\$11.00	\$13.44	\$11.00

Figure 7: Assistant Teacher Wage						
	5	4	3	2	Unrated	Private
<b>Region 1*</b> (0.000)	—	\$14.50	\$11.00	—	\$11.00	\$13.50
<b>Region 2*</b> (0.016)	—	\$12.50	\$11.48	—	\$11.00	\$11.00
<b>Region 3</b>	\$17.00	\$12.13	\$13.11	\$12.38	\$11.60	\$13.00
<b>Region 4</b>	—	\$15.50	\$15.27	\$13.42	\$13.37	\$14.77
<b>Region 5</b>	—	\$11.15	\$12.12	\$11.20	\$11.60	\$15.50
<b>Region 6</b>	—	—	\$13.15	\$11.00	\$11.23	\$13.50
<b>Spokane</b>	—	\$11.76	\$11.16	\$11.00	\$12.25	\$11.00

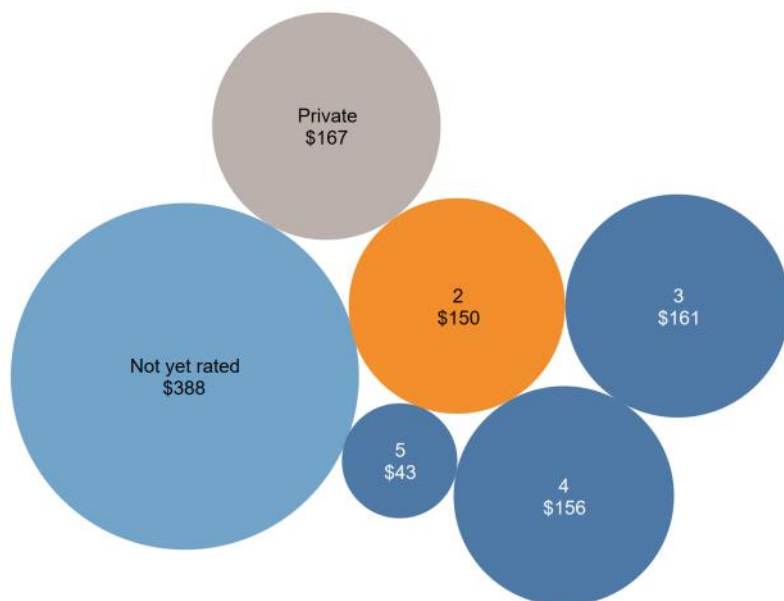
Several other aspects of teacher positions demonstrated interesting trends in the data analysis. Centers are significantly more likely to require any level of college for assistant teachers as quality level increases. This is evidence that centers that hold staff to a higher standard than required by the State may receive higher quality ratings. Additionally, researchers found that teacher turnover had a negative trend with quality level. This is statistically significant for assistant teachers at the .05 significance level. This is most likely due to less teacher turnover at high-quality centers. As for staff, salaries for directors and program supervisors are significantly higher at centers with higher quality levels in some regions.

Costs depend on the size of the center. To compare centers of different sizes, researchers found the costs per enrollment. The figures below show these results for Early Achievers fixed and variable costs grouped by region and quality rating. "P" denotes private providers and is thus colored gray to separate it from the Early Achievers participants. Centers with good quality ratings (Levels 3, 4, and 5) are in dark blue. Unrated centers are in light blue. Centers with a low-quality level are in orange (Level 2).

The averages for Early Achievers fixed costs per child are distinct at the .05 significance level ( $p\text{-value}=0.0498$ ). Fixed costs are a one-time investment; these costs do not include time-dependent variables such as rent or utilities. Many respondents reported fixed costs of facility improvement, supplies, or establishing a program. The large amount of fixed cost per enrollment for unrated centers may show preparation for evaluation. The figure for Level 2 is lower than Levels 3 and 4, explaining part of the quality disparity.

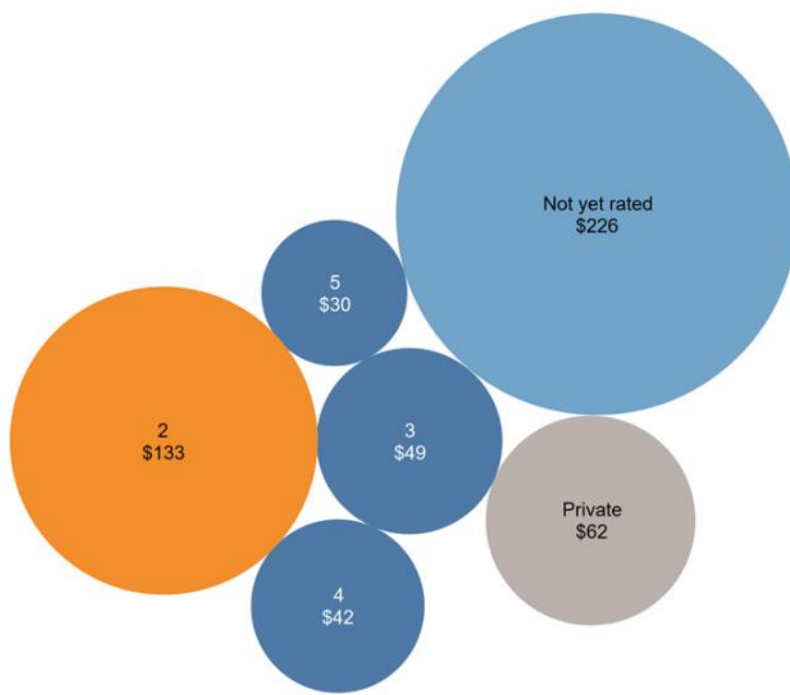


Figure 8: Early Achievers Fixed Costs Per Enrollment



Variable costs in this report are a monthly cost for Early Achievers, in contrast to the one-time fixed cost described above.

Figure 9: Early Achievers Variable Costs Per Enrollment, Monthly



While not statistically significant overall, using t-testing researchers determined that there is a difference between:

- Centers that have not yet been rated and Level 3 ( $p\text{-value}=0.047$ ), and
- Centers that have not yet been rated and Level 4 ( $p\text{-value}=0.043$ ).

This is evidence that unrated centers may be spending more in Early Achievers to prepare for evaluation. Coupled with the fixed cost analysis, this high investment may signify center buy-in to Early Achievers. Further, descriptive statistics show a high average for Level 2 centers. This may signify these centers are working to improve their quality before their next evaluation.

## Regression Results

Regression models described relationships between variables and Early Achievers quality level. Incomplete responses and the creation of sub-sets for analysis affected the availability of significant figures. Results are at the .10 significance level unless otherwise specified. Researchers describe the statistically significant relationships below:

- Total enrollment – There is a positive relationship between the number of children served by a center and quality level, all else held constant. This may be due to large centers having more resources, or benefits from economies of scale.
- Diversity – Centers with a multicultural influence are more likely to have a higher rating, all else held constant. Researchers define this variable as a center having some staff with ethnicity, race (other than white), or a language other than English. This effect may be due to the benefit of cultural exposure or the involvement of the community.

## Recommendations

### Future Surveys

During investigation, DEL has noted difficulties to be aware of as well as some successful strategies. The chief concern with this survey seems to have been its length and extensive questions. The introduction set the time expectation of 20-40 minutes, but many of our respondents reported it was much longer. As such, many did not complete the survey, which left the researchers with incomplete data. Additionally, many respondents expressed that summer is difficult for them to set aside time for surveys. Many were busy, on field trips, or on vacation. Yet, due to the demanding nature of child care, researchers are not sure what the optimal survey deployment window would be. This is an area where researchers recommend provider feedback. Researchers determined oversampling was a good strategy.

### What does “all else held constant” mean?

In regression analysis, relationships between the independent and dependent variable are quantified. These estimates allow one to isolate the direct relationship between variables.

Regression models allow the researcher to keep every other variable constant—the only change is the one-unit increase in the chosen variable. Therefore, one can quantify the direct effects between dependent and independent variables.

Researchers screened out over 50 centers in the sample due to outdated or duplicate information. Other surveys should prepare for these considerations with DEL’s current record system.

Additionally, the survey showed that center directors had difficulty quantifying costs. This is due to a variety of reasons. Questions did not apply to all respondents, there is no uniform reporting system, and it is impractical to break up costs for some facilities. These difficulties affected the data. Respondents skipped questions, some answers seemed erroneous, and some characteristics had few observations. This made it hard to preserve degrees of freedom in analysis. Researchers found these factors reduced the number of statistically significant figures.

The largest success with the deployment of the survey was with the follow-up calls.

Interviewers received positive feedback from respondents on interviews. This strategy is what led to the ample response rate. For future surveys, the researchers recommend that calls establish personal contact with respondents.

### Policy Implications

This purpose of this investigation is to better understand the costs associated with Early Achievers and inform decisions related to subsidy policy. By identifying trends and key relationships, DEL can work to promote continuous quality improvement at child care centers. As Early Achievers is still relatively new, observing trends is important as more providers register and improve their quality levels.

Analysis did not uncover a single strategy of improving quality, rather a suite of strategies that lead to high-quality child care.

Improving the working environment for employees generally appears to improve the level of quality of the center. Researchers determined positive trends with wages and assistant teacher education. Less teacher turnover also contributes to higher quality levels. It appears that centers that create a positive job experience are more likely to be high-quality.

Additionally, high-quality centers appear to be larger, experienced, and supported by the community. Researchers determined this by the positive relationships between quality and in-kind donations, years in operation, and total enrollment. These findings suggest that DEL can expect centers to improve in quality over time. Since it seems established centers rate higher in the Early Achievers system, DEL can improve quality by supporting less-experienced providers.

Researchers also found that unrated centers appear similar to centers with a rating of 3. This makes sense, as Level 3 is the foundation of quality and is where most centers initially rate. Level 2 centers show areas with an obvious need of improvement or investment, as expected with the Early Achievers model. Unrated centers look like they are preparing for evaluation, suggesting center buy-in to Early Achievers. As more centers rate in Early Achievers, future researchers will be able to draw further conclusions.

This study has shown the value of the Early Achievers framework and the early investments made by both the federal and state governments in that framework over time. It has also shown that private tuition costs are not significant indicators of quality. Thus, private pay tuition rates are not market signals of quality. This means that a higher tuition rate does not equal a higher quality of child care. This makes it difficult for parents to know the quality of the care they are buying. The State therefore has a role to play to promote transparency and economic

efficiency. Early Achievers does this with the child care market by rating the quality level of the provider for the parent to see.



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# Appendix

## Appendix 1: Variables

Variables		
Short Name	Long Name	Source
Qual	Early Achievers Quality Level	DEL records
Region	DEL center region	DEL website
PosYrs	Number of years in position	Survey
OpYrs	Number of years the center has operated	Survey
Capacity	Difference between desired enrollment and total enrollment	Calculated from survey data
KidpClass	Total enrollment divided by number of classrooms	Calculated from survey data
Indoor	Square feet of licensed indoor space	Survey
Outdoor	Square feet of licensed outdoor space	Survey
Space	Square feet of total licensed space, divided by total enrollment	Calculated from survey data
PPInfR	Private pay infant tuition, monthly	Calculated from survey data
Infants	Binary, does the center serve infants	Survey
SchAge	Binary, does the center serve school age children	Survey
PPKids	Percentage of children served that are private pay	Calculated from survey data
TE	Total enrollment	Survey
SSub	Percentage of children served that are on state subsidy	Calculated from survey data
OSub	Percentage of children served that are on other subsidy	Calculated from survey data
SNeeds	Binary, does the center serve special needs children	Survey
LTRatio	Total enrollment divided by number of lead teachers	Calculated from survey data
ATRatio	Total enrollment divided by number of assistant teachers	Calculated from survey data
LWage	Lead teacher hourly wage	Survey
Open	Lead teacher position openings per month	Survey
Instruct	Hours of instruction for lead teachers, daily	Survey
AdPers	Number of center administrative staff	Survey
Benefits	Binary, does the center offer benefits to employees	Survey
LeadColl	Binary, does the center require some form of college for lead teachers	Survey
Inkind	Binary, does the center receive in-kind donations	Survey
FacAdmin	Out of pocket facility and administrative variable costs, monthly	Survey
ChildOut	Early Achievers variable costs for child outcomes, monthly	Survey
CStaff	Early Achievers variable costs for staff, monthly	Survey
Proffam	Early Achievers variable costs for professional development and family engagement, monthly	Survey
EA Cost VCEA	Total variable cost for Early Achievers, monthly	Calculated from survey data
AddVC	Early Achievers additional variable costs, monthly	Survey
FC FCEA	Total fixed cost for Early Achievers	Calculated from survey data

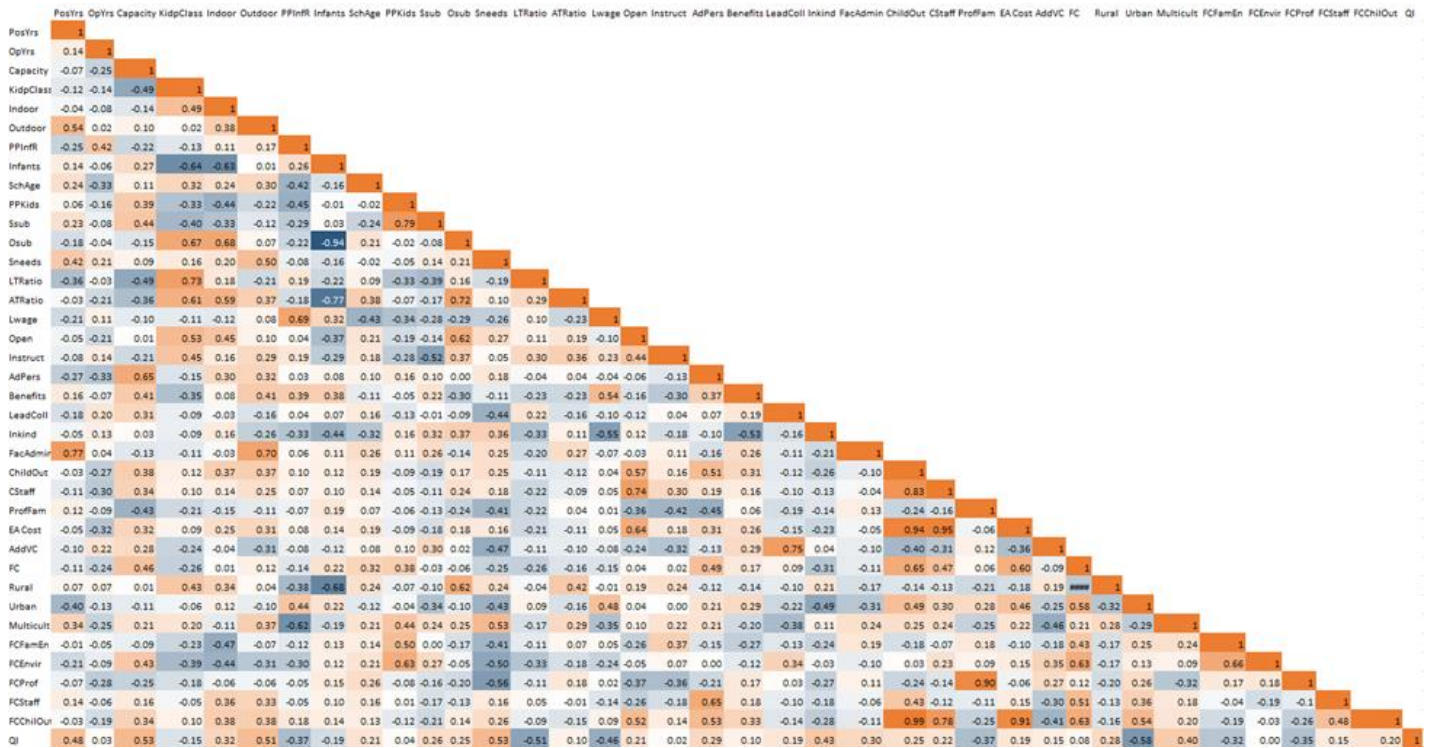
# Appendix

## Appendix 1: Variables

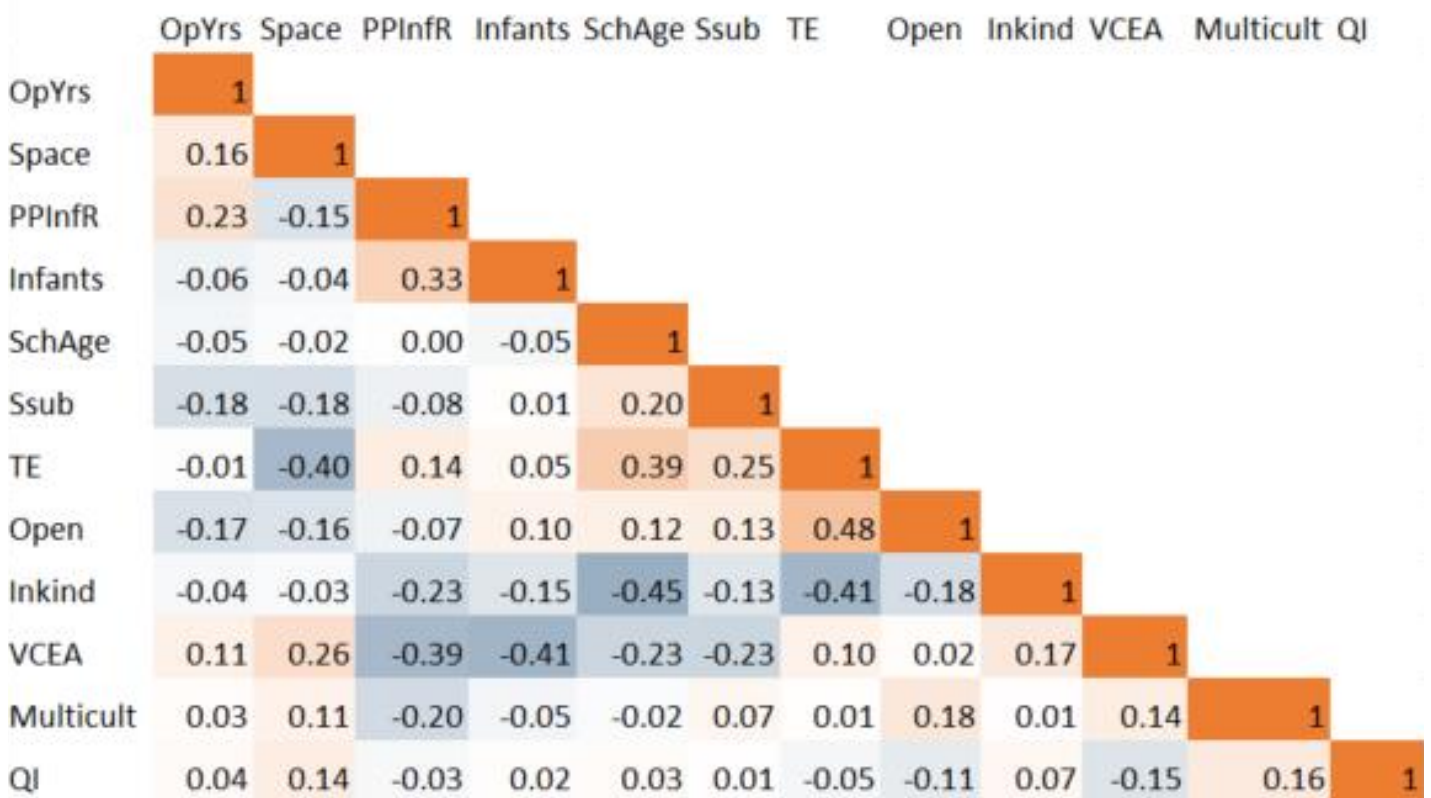
Variables (continued)		
Short Name	Long Name	Source
AColl	Binary, does the center require some form of college for assistant teachers	Survey
Rural	Binary, is the center located in a rural area	DEL records
Urban	Binary, is the center located in an urban area	DEL records
Multicult	Binary, does the center staff have a race or ethnicity other than white or have a primary language other than English	DEL records; MERIT
FCFamEn	Early Achievers fixed costs for family engagement	Survey
FCEnvir	Early Achievers fixed costs for environment	Survey
FCProf	Early Achievers fixed costs for professional development	Survey
FCStaff	Early Achievers fixed costs for staff	Survey
FCChildOut	Early Achievers fixed costs for child outcomes	Survey
QI	Binary, has the center received a quality improvement award in the past year	DEL records

# Appendix

## Appendix 2: Original Correlation Matrix



## Appendix 3: Model Correlation Matrix



# Appendix

## Appendix 4: Logistic Regression Model

Logistic Regression	
OpYrs	0.005695 [0.007618]
Space	0.0003852 [0.001062]
PPInfR	0.0002952 [0.0002430]
Infants	0.2594 [0.3322]
SchAge	-0.2471 [0.1921]
Ssub	0.3285 [0.2963]
TE	0.004128 . [0.002192]
Open	-0.03525 [0.02217]
Inkind	0.2952 [0.1889]
VCEA	-0.000001469 [0.000002614]
Multicult	0.2895 . [0.1594]
QI	1.298 *** [0.1650]
Intercept	0.5507 [0.5587]
Model p-value	0.001378894
Null deviance (DoF)	52.567 (66)
Residual deviance (DoF)	20.557 (54)
AIC	138.98



# Appendix

## Appendix 5: Special Needs Care

Special Needs						
	5	4	3	2	Unrated	Private
# that offer	1	12	72	6	40	16
% that offer	100%	75%	66%	43%	65%	62%
Charge higher rate	—	14%	7%	8%	9%	—
Receive subsidy	—	38%	13%	8%	7%	—
Expenses covered by subsidy	100%	31%	14%	20%	10%	5%

## Appendix 6: Employee Benefits

Benefits						
	5	4	3	2	Unrated	Private
Full-time	100%	81%	68%	71%	61%	77%
Part-time	0%	38%	29%	29%	29%	38%
Medical insurance	—	50%	36%	29%	24%	46%
Dental insurance	—	13%	22%	14%	11%	12%
Vision insurance	—	13%	13%	14%	8%	8%
Retirement	—	38%	21%	9%	15%	15%
Vacation	—	38%	22%	—	19%	23%
Sick days	—	25%	23%	—	15%	12%
Holidays	—	6%	17%	—	19%	4%
Discounted child care	—	13%	11%	29%	11%	4%
Paid time off	—	19%	10%	—	10%	8%
Professional development	—	13%	10%	—	6%	—
Disability	—	5%	3%	—	8%	—
Life insurance	—	6%	4%	—	6%	4%

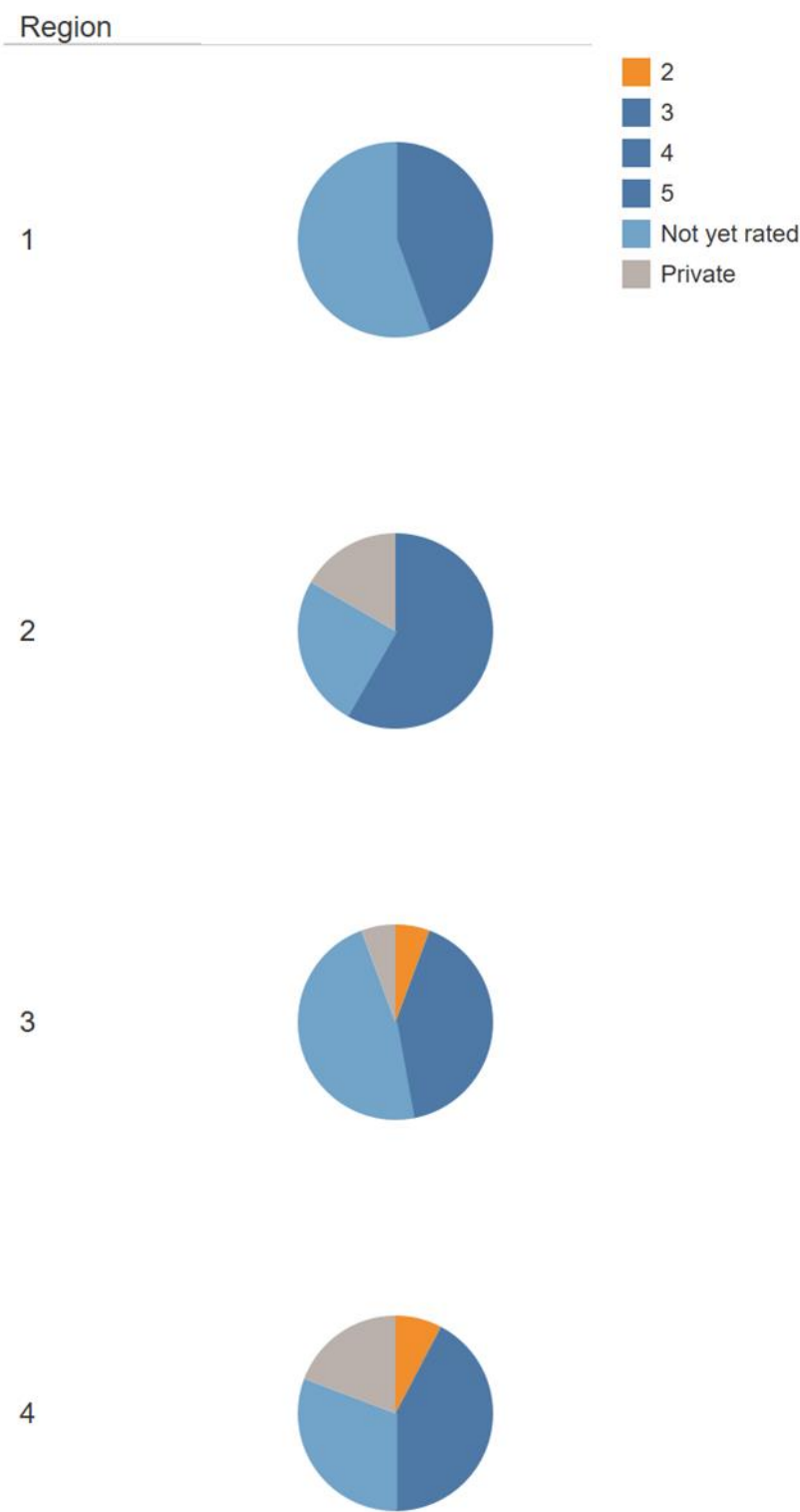
# Appendix

## Appendix 7: Center Staff Wages

Staff Wages					
	4	3	2	Unrated	Private
<b>Directors*</b> (Region 4, 0.037)					
<b>Average # of staff</b>	1	1	1.25	1	1.25
<b>Hourly wage</b>	\$22.18	\$22.00	\$19.18	\$20.85	\$27.46
<b>Program Supervisors*</b> (Region 1, 0.047)					
<b>Average # of staff</b>	.5	.5	.75	.5	.5
<b>Hourly wage</b>	\$18.42	\$17.02	\$16.60	\$16.86	\$20.81
<b>Administrative Assistants</b>					
<b>Average # of staff</b>	.75	.5	.75	.5	.75
<b>Hourly wage</b>	\$15.83	\$15.68	\$15.23	\$14.57	\$17.87

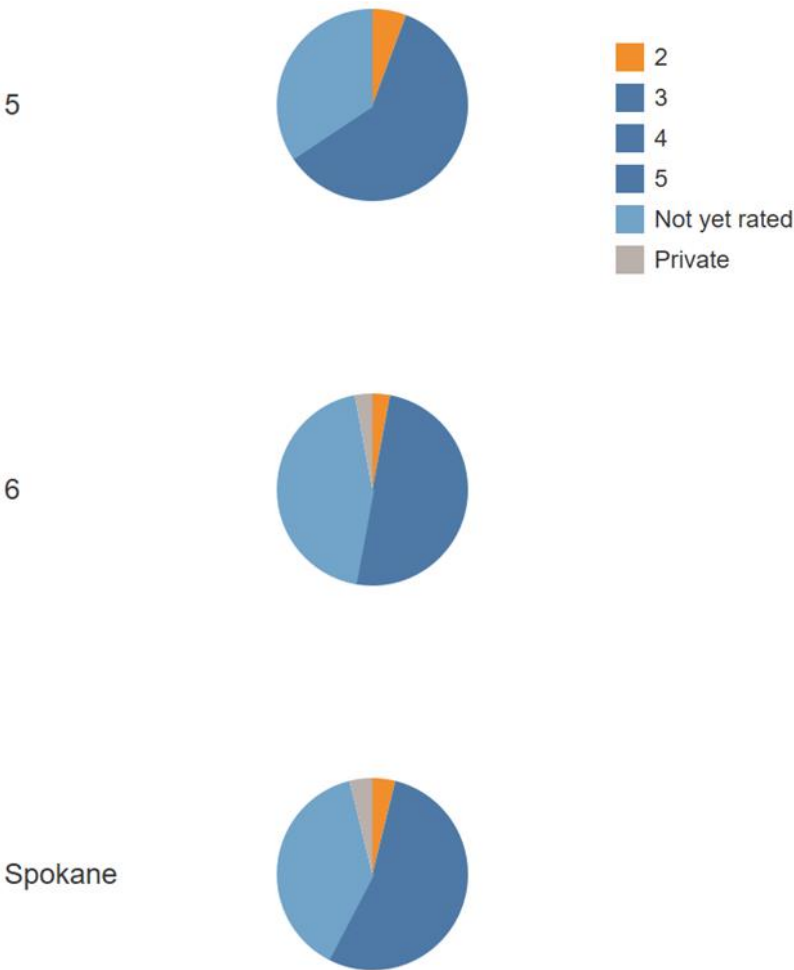
# Appendix

## Appendix 8: Variability in Early Achievers Level by Region



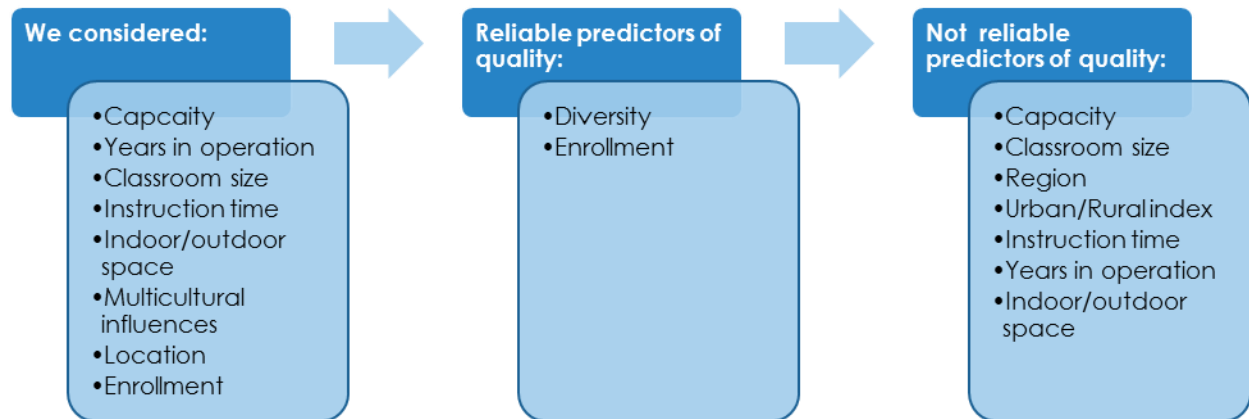
# Appendix

Appendix 8: Variability in Early Achievers Level by Region (continued)

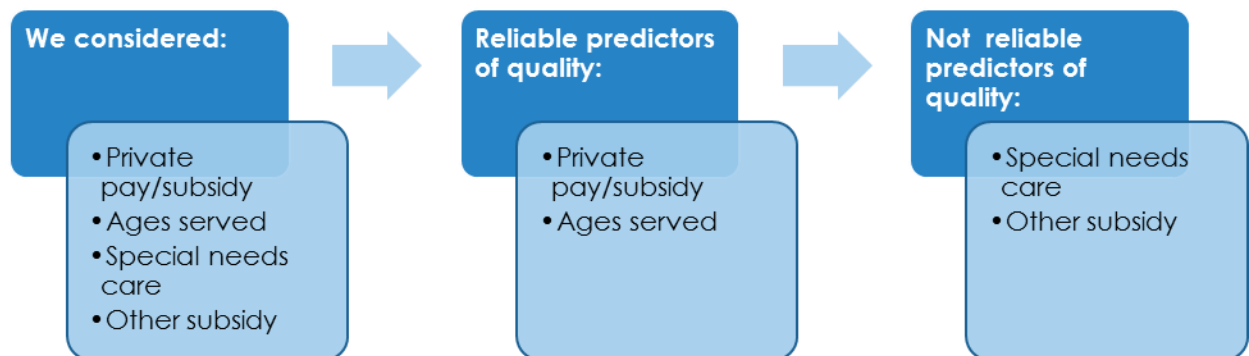


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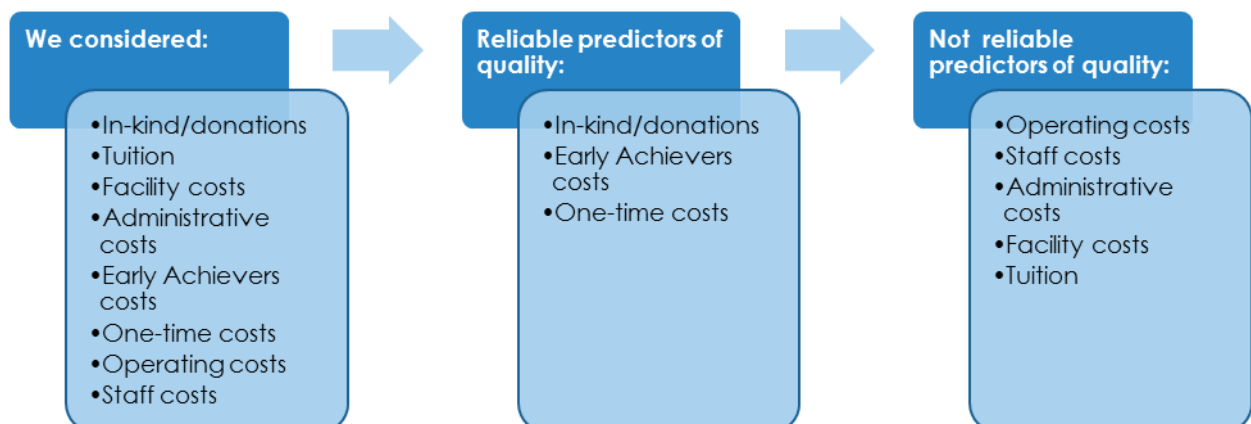
## Appendix 9: Center Characteristics



## Appendix 10: Enrollment Statistics



## Appendix 11: Costs and Revenue





# Appendix

## Appendix 12: Lead Teacher Wage by Child Care Aware Region

Lead Teacher Wage						
	5	4	3	2	Unrated	Private
<b>Central</b>	—	\$16.70	\$12.89	—	\$11.50	\$19.70
<b>Northwest</b>	—	\$13.94	\$14.29	\$15.00	\$13.41	\$14.17
<b>King and Pierce</b>	—	\$15.79	\$15.84	\$14.63	\$18.51	\$19.75
<b>Southwest</b>	\$21.00	—	\$12.54	\$12.50	\$13.18	\$21.00
<b>Peninsula</b>	—	—	\$15.36	\$11.00	\$12.61	—
<b>Eastern</b>	—	\$13.11	\$12.09	\$11.00	\$13.54	\$11.00

## Appendix 13: Assistant Teacher Wage by Child Care Aware Region

Assistant Teacher Wage						
	5	4	3	2	Unrated	Private
<b>Central</b>	—	\$13.50	\$11.39	—	\$11.00	\$11.83
<b>Northwest</b>	—	\$12.13	\$11.75	\$12.83	\$11.61	\$13.00
<b>King and Pierce</b>	—	\$14.41	\$14.18	\$12.86	\$14.76	\$14.82
<b>Southwest</b>	\$17.00	—	\$13.39	\$11.00	\$11.30	\$14.00
<b>Peninsula</b>	—	—	\$14.42	\$11.00	\$11.41	—
<b>Eastern</b>	—	\$11.76	\$11.24	\$11.00	\$12.71	\$11.00



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