UNIVERSITY of LOUISIANA LAFAYETTE

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Impact Evaluation of a Randomized Child Care Teacher Pay Increase in Louisiana

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Executive Summary

Like many states, Louisiana faces persistent challenges in retaining early childhood education (ECE) teachers, particularly in center-based child care settings serving families eligible for the Child Care Assistance Program (CCAP). Annual turnover among child care teachers routinely exceeds 30–50 percent, undermining workforce stability, program quality, and continuity of care.

In response, the Louisiana Department of Education (LDOE), in partnership with the Kathleen Babineaux Blanco Public Policy Center, implemented a randomized pilot program to evaluate whether direct wage supplements for child care teachers could improve retention, and replicate findings from prior work performed in other states. Using federal child care stabilization funds, the pilot recruited eligible Type III CCAP centers statewide. Enrolled centers were randomly assigned to one of three conditions: (1) a 10 percent supplement to teachers' base hourly pay, (2) a fixed annual supplement equivalent to $2,080 (approximately $1 per hour for full-time work), or (3) a control group that did not receive teacher pay supplements.

This evaluation followed 8,093 teachers across 544 centers across the state. Teacher turnover over was examined over 24 months (August 2022–August 2024) using detailed quarterly data collected directly from centers. Survival models of turnover over time were used to leverage further insight into the treatment effect within this randomized design, and examine potential additional associations of turnover to wages, center-level education and performance, center staffing size, and area poverty.

Key Findings

A wage supplement at the current level did not to substantially reduce turnover.
Across all analytic approaches, the assignment to either the 10 percent wage supplement or the $2,080 stipend was not associated with statistically significant reductions in teacher turnover compared to the control group. Fluctuations in quarterly turnover were observed, but cumulative turnover was approximately 48 percent for all three groups by the end of the two-year period.

Teacher pay levels, teacher education, and center-level performance demonstrate strong associations with retention.
Higher hourly wages were consistently associated with lower turnover risk. Teachers working in higher-performing centers—as measured by LDOE's composite performance score—were less likely to leave than teachers at lower-performing centers. In contrast, higher turnover was observed at centers with higher proportions of teachers without postsecondary credentials.

Turnover is considerably higher among teachers hired after the pilot began.
Teachers who entered centers during the pilot period, rather than being employed at baseline, faced significantly higher risks of turnover. This cohort effect is consistent with broader ECE literature showing that new hires are more likely to leave and underscores the challenge of stabilizing the workforce in high-churn labor markets.

Substantial unobserved differences across centers contribute to turnover.
Survival models indicate that turnover risks vary meaningfully across centers for reasons not fully captured by teacher pay, and characteristics measured at the center level and community level, but could be explained by other factors that vary across centers such as teacher motivation, center culture and leadership, as well as broader local labor conditions.

Policy Implications

The results of this randomized evaluation suggest that supplements at a level of approximately $1 per hour, or 10% of wages (recognizing that median pay is $12.00), are unlikely to provide a substantial buffer against turnover risk in a two-year period. This finding should be considered in the context of the Louisiana labor market and prevailing wages within child care relative to other job alternatives. With the patterns explored in the data, we point toward well-known trends that can add to the discussion of comprehensive, sustained compensation, and quality improvement strategies within state funded child care. The Louisiana specific evidence in this study may inform future investments in the early childhood workforce, and can assist with policy making around the economic and organizational realities of child care teachers and providers statewide.

Introduction

Early care and education (ECE), which includes center- and home-based childcare, preschool, and specific early learning programs (e.g., Headstart), can provide infants and young children with environments that assist their cognitive, social, and emotional development (Bailey et al. 2021; M. R. Burchinal et al. 2000, 2002). ECE in center-based settings needs to be fully staffed by early educators trained in the development of cognitive, social, and emotional skills (Tran and Winsler 2011). Yet the workforce supporting ECE has among the highest turnover levels in the country, and as many as 30-50% of ECE teachers leave their position within a year (Bassok, Markowitz, et al. 2021). The reasons are often connected to child care work environments that provide low wages, a lack of benefits, and overall low morale (Whitebrook 1999; Whitebrook et al. 2001; Burton et al. 2002). Researchers have also found that teacher retention within ECE requires that child care directors offer opportunities for advancement and tenure over time (Gable et al. 2007). Collectively, these studies suggest that effectively addressing turnover takes a holistic approach.

State education leaders have developed programs for increasing ECE teacher training, wage incentives, and benefits, demonstrating the potential improvements that come with targeted investments in child care teacher retention (Cooney 2008; Boyd and Wandschneider 2004; Clotfelter et al. 2006). Yet state-administered programs often have work stipulations, may be limited to one region within the state, or may provide only limited data speaking directly to the relationship between teacher pay and turnover.

Teacher hourly wage increases remain an area of interest for state programs and providers seeking to stabilize the childcare workforce. Research on the relationship between increased ECE teacher pay and retention through a direct application of funds to hourly wages is limited to two recent studies discussed below. Further targeted research into the effect of pay on ECE teacher retention is needed. The current evaluation is of a randomized grant program providing supplemental payment to child care teachers, and provides a unique opportunity to study the effect of early educator compensation on teacher retention, as well as inform state policy and ECE center pay structures to support the child care teacher workforce.

Turnover in ECE

Turnover is one of the most pressing issues in ECE settings, but particularly within the childcare teacher workforce (Dichter and LiBetti 2021; Whitebrook and Sakai 2003). There are approximately 2.5 million workers in the child care sector over the course of a year, and approximately 20% (500,000) are employed as full-time teachers (Burton et al. 2002)[1]. ECE teacher turnover annually averages around 30%, and in recent years has been explored within states with high turnover (Bassok, Markowitz, et al. 2021; Bryant et al. 2023). Louisiana's annual turnover rate between 2018 and 2019 ranged from 30% to almost 70% in some areas of the state, as found in state agency records (Bassok, Markowitz, et al. 2021). In addition, Louisiana observations from the same period reveal nearly a third of lead teachers may no longer be employed within the child care sector, and very few leavers of the child care sector remained employed in a similar capacity as teachers (Bassok, Markowitz, et al. 2021). Many teachers who leave within a year completely tend to vacate the child care workforce, although the turnover data into this problem are historical. The next section presents some of the current drivers of turnover, which are thought to be low pay, limited job benefits, and other factors associated with teacher and center performance.

[1] More recent estimates put the total child care workers employed in the country at 497, 450 (Bureau of Labor Statistics, https://www.bls.gov/oes/2023/may/oes399011.htm).

Wages and Benefits

High turnover can be directly tied to child care worker wages. Historical data on child care wages show the levels compared to other education settings as chronically low. Hourly wages for child care teaching positions are typically between $12-15 an hour.[2] Wages can vary due to state and regional supply and demand for child care (Morrissey 2017; Kathleen Babineaux Blanco Public Policy Center 2021). Whitebrook (1999) first surveyed workers and found that the problem of low wages in the ECE workforce was pervasive nationally. This study is reinforced by recent findings that ECE workers are earning wages in many states that fall below the poverty line, and child care teacher compensation lags teacher compensation in preschool, elementary, and middle school (Center for the Study of Child Care Employment 2022). Many childcare teachers also report a lack of fringe benefits or policies that facilitate going to work such as discounted child care for family members (Hur et al. 2023). It is clear that teacher retention and recruitment is influenced by the competitiveness of teacher wages and benefits relative to other opportunities in the labor market. These factors work with a collection of others that are associated with increased leaving, as discussed in the next section.

Teacher and Center Performance

Teacher and Center performance in ECE, often associated with measures of care quality, contributes to the issue of teacher retention. Previous research has demonstrated that teacher performance as measured by the education, skills, and knowledge of child development possessed, is correlated with improved social and emotional outcomes in children (Tran and Winsler 2011; Cole 2014). A higher performing teacher can also be expected to stay longer in the profession than a lower performing teacher. Bassok, Markowitz et al. (2021) showed that within Louisiana, teacher retention is related to initial teacher performance ratings of their developmentally appropriate skills and classroom management within the first year of employment. Using Classroom Assessment Scoring System (CLASS) scores as a marker of quality teacher-child interactions, the researchers analyzed the teacher observational data collected by the state agency within the first year of employment with teacher leave data measured as still employed after 9 months. Overall teachers who tended to leave their job had an average score of 0.33 points lower on the CLASS than those who stayed through the end of the study period, suggesting that improvements in teacher quality over time could lead to better retention.

The literature at large has generally not supported the idea that teacher pay fully reflects teacher performance measures of quality. Factors associated with teacher performance such as emotional and social sensitivity, level of education, and experience are important to teacher quality but are less related to level of pay (Torquati et al. 2007). Bassok, Markowitz et al. (2021) highlight the connection between ECE teacher performance and retention using data on Louisiana child care centers and demonstrate how in several states there are policies of standardizing performance to attach to teacher bonuses and benefits so that teachers are incentivized to stay longer and gain in quality over time.

Teacher performance contributes to center performance and centers can serve as distinct drivers of turnover that may be a particular focus of teacher retention efforts. Center performance includes a variety of factors that have been measured using tools (e.g., Classroom Assessment Scoring System, or CLASS). Assessment data on the teacher-child interactions in ECE settings can serve as a proxy of teacher quality and, when grouped by center, a proxy for quality of the center.

[2] See the appendix for a more detailed picture of annual earnings of child care workers in the US and Louisiana.

Performance measures also include the center's fidelity to developmentally appropriate curriculum and practices, and staff and family reported satisfaction levels. All of these factors are moderately associated with center quality, with better performing measures focused on curriculum and teacher use of developmentally appropriate best practices (M. Burchinal 2018). Low center performance has been shown to be a driver of high turnover in Louisiana. A recent study on high turnover centers, measured as more than half of teachers leaving in a year, showed that one third of centers in the state have persistent turnover at this higher rate for two years or longer (Doromal et al. 2022). Though persistent staffing issues are an undercurrent in many ECE settings, the study findings reveal that some centers experienced persistently higher turnover for multiple years consecutively that contributes to disruptions in organizational support. The results from Louisiana are a reinforcement of the recognition that center performance (labeled as high vs low quality ECE) and teacher turnover rates are connected (Torquati et al. 2007; M. R. Burchinal et al. 2002; Whitebrook and Sakai 2003). Beyond general associations, developing a better understanding of the drivers of turnover may inform policies on training and workforce development within ECE if evaluated in conjunction with targeted program efforts to improve retention.

Center Support and Teacher Motivation

There are many responsibilities with being an ECE teacher that often add stress. As discussed earlier, the organizational support and climate of a center, especially in stressful environments, plays a significant role in teacher retention. Theorists have long considered organizational support of staff behavior to be fundamental to the values and desires of employees to perform and remain in their job (Self-determination theory; Deci and Ryan 2008). By extension, an ingredient of childcare teacher retention is the degree to which the center supports the motivation for teaching, often measured by teacher report of their intrinsic (driven by personal values, beliefs, and internal satisfaction) and extrinsic goal motivation (external rewards, work culture, and economic pressures) motivation. Torquati et al. (2007) demonstrated in ECE teachers the intrinsic motivation for childcare work in conjunction with increased benefits, desirable work tasks, resources, and lower workload helped to mitigate the stress of work, but intrinsic motivation to work with children predicted early signs of retention most strongly compared to other measures. Others have observed teachers tend to remain longer at centers with extrinsically motivating opportunities such as ECE benefits and policies (e.g., free child care for their own children, flexibility in work schedule) and opportunities for growth and development professionally (Hur et al. 2023). While some childcare professionals appear to draw from intrinsic values such as the personal identity around caring for children, many report that work culture and social ties help them to stay longer within their center when job stressors are high (Whitebrook and Sakai 2003). Thus the extrinsic drivers could bolster organizational supports to help most teachers stay as compared to a smaller group of highly motivated teachers.

Macro-Level Causes

Tracking turnover across the US shows that many states struggle to maintain an adequate child care teacher workforce. A recent study (Bryant et al. 2023) shows that in multiple states the level of child care teacher turnover annually is 30% even among higher quality centers. This may point to overall child care sector issues given that turnover is particularly systemic even compared to other education sectors (Whitebrook and Sakai 2003; Doromal et al. 2022; Bassok, Markowitz, et al. 2021). Apart from isolated studies it is difficult, however, to compare states due to a lack of unified data on turnover collected across states to compare rates. In addition to individual factors that influence the likelihood of leaving such as education level, experience, and other personal teacher characteristics, there can be community or macroeconomic factors that influence turnover such as

recessions, as well as shutdowns of centers, as found by Doromal et al. (2022) in their study of centers with persistent teacher shortages. During the COVID-19 coronavirus pandemic in 2020, states began experiencing more center closures, restricting access to childcare (Kathleen Babineaux Blanco Public Policy Center 2021). As the impacts of the COVID-19 pandemic are better understood over time, it will be important to study case examples in states. In a more general way, this points to the importance of considering the context of the market when studying turnover.

Compensation Strategies and Retention

Directing compensation strategies to improve teacher retention can include providing teachers and staff a competitive starting salary, raises to annual income, cash incentive stipends that are received once or multiple times in a year, tax credits provided for financial relief, as well as fringe benefits and bonuses for recognition (Dichter and LiBetti 2021). Efforts to increase pay equity have been implemented across many states, and many view the practice as an effective evidence-based strategy (Prenatal-to-3 Policy Impact Center 2025).

K12 Teachers

While pay scales and job attributes differ between the ECE setting and elementary and secondary schooling (K12), there are many similarities and lessons learned from prior efforts to address K12 teacher turnover.

Pay Raises and Incentives

Recent studies on K12 teacher raises show that increasing base pay can increase teacher experience and lower the likelihood of teachers seeking alternative earning opportunities (Hansen et al. 2004; Clotfelter et al. 2006; Hendricks 2013). Specifically, Hansen et al. (2004) found that teachers experiencing a 1% increase in base pay declined in turnover by 0.7%, implying that if districts raise pay by 10%, turnover could decline by 7% from 9.3% across all teachers. Hendricks (2013) also found that base pay additions to teacher salary not only lead to a better one-year job retention rate, but also generally leads teachers to acquire more years of experience despite some leaving their current school. The evidence supports the intuitive hypothesis about teacher wages relative to other opportunities as helping encourage teachers to stick with the profession. For example, a teacher with a certain level of experience has the choice of remaining in the position or separating from their profession, and makes that choice while weighing teaching compensation, non-teaching compensation, and their preference for teaching vs non-teaching employment (Hansen et al. 2004).

The K12 literature also shows that pay measures such as retention bonuses help reduce turnover, especially in hard-to-staff schools, supporting the theory that compensation may serve as an appropriate extrinsic motivator to counter the difficulties of a stressful work climate. Clotfelter et al. (2006) examined how North Carolina addressed turnover in hard-to-recruit schools. The program focused on hiring newly certified teachers for middle and high school in low-income serving areas with an annual bonus of up to $1,800. Teachers accepting the program bonus were 12% less likely to turnover compared to the turnover rate prior to program implementation. The program had the strongest impact on teachers with 10-30 years of experience, suggesting the raises could have helped teachers who may have experienced difficulty in sustaining their motivation to remain in the profession.

Research on pay measures within the K12 literature, as shown through studies of base pay increases and retention bonuses, suggests that educator compensation moves the needle on

retention. Results from studies of pay incentives in K12 settings show that it directly improves the attractiveness of the teaching career to both new and experienced teachers.

ECE Teachers

Pay measures would be expected to work within ECE childcare settings as they do within K12 settings, but data on ECE teachers and pay is more limited and there has been less research on the topic. It is also noteworthy that the overall level of pay is much lower in ECE childcare settings as noted previously. While pay in ECE settings may be contributing to high industry turnover, it remains unclear how much pay relative to other factors is driving that trend. While some previous literature, reviewed below, has addressed the impact of workforce programs on child care teacher retention, there remains little evidence on the question of how much increases in pay will reduce job turnover causally, if at all, and how large a change in pay may be needed to have a meaningful impact on turnover.

Pay Raises and Incentives

In North Carolina, the WAGE$ program, which provided stipends and pay raises to ECE teachers, was found to have positive effects on retention (Clotfelter et al. 2006). The researchers showed that implementing the program by providing supplements to hourly pay for 3,510 child care teachers moved the income level up, and resulted in a noticeable decline in turnover. A group that saw pay increase from around $12 an hour to $15-$19 an hour had turnover reduced to 12% after a year as compared to the statewide center teacher average turnover of 21%. The WAGE$ program also included incentives to cover professional development and education opportunities for staff of full time and part-time status.

In Washington State, the Career and Wage Ladder Pilot Project (CWL) program offered career ladder opportunities, benefits packages, and wage-based cash incentives to select ECE centers (Boyd and Wandschneider 2004). Teachers in the CWL program received a $0.25 hourly rate increase based on participating in subsidized child care, and qualifying centers were enrolled if there were fewer than 25% of children at the center receiving child care subsidies. The overall impact of the pilot was mixed for CWL participating teachers. It was found that pilot centers did not differ from comparison centers when examining average turnover across all teachers enrolled. Pilot center teachers stayed an average of 28.7 months while comparison teachers stayed an average of 27.5 months. Differences at the center level emerged when examining teachers hired within the first 3 months of the pilot, which showed a 19% level of retention for pilot centers, and an 11% retention level for comparison centers. This speaks to the idea that cash incentives may help with the initial recruitment and immediate retention of teachers.

Boyd and Wandschneider (2004) pointed out that CWL teachers of different position types had different levels of retention. The teacher aides and part time teachers left most frequently, full time teachers left second most frequently, and then supervisors and site coordinators left the least. The retention by education analyses showed that teachers with education in an early childhood field were significantly less likely to leave. Teacher participation in the pilot also led to an increased pursuit of education with 72% of employees in the pilot taking teacher training workshops compared to 63% in the comparison group. A separate follow up evaluation of the CWL cohorts showed that across the pilot and comparison groups, those teachers receiving more money at their job over time had higher rates of retention over the 3-year period (Cooney 2008).

Some states, including Louisiana, Nebraska, and Colorado have used ECE workforce training programs to provide cash incentives or tax credits to teachers for earning professional development and voluntary advancement (Dichter and LiBetti 2021). Gable et al. (2007) evaluated

the Missouri Workforce Incentive program (WIN) which offered a scaled cash incentive to child care teachers and directors for continuing to work while obtaining professional development credits. Monitoring quarterly turnover and hourly pay for approximately 2 years, the researchers found 92% of WIN program teachers remained in the workforce compared to 79% of comparison teachers who did not receive WIN program assistance at first quarter follow up (measured by survival odds), and 70% of WIN participating teachers remained compared to 54% of comparison teachers at the final quarter follow up. The researchers did not use random assignment to the treatment conditions so participating teachers may have been systematically more committed to long term work in ECE, and there were issues with balance in the sample design with WIN teachers typically older and more educated than non-WIN comparison teachers. However, the study results reinforce the finding that education and experience are important factors to teacher retention.

Taken together, the evaluations of workforce programs to support ECE workers shows that pay interventions serve as a potentially useful vehicle for improving teacher workforce retention, and that to accurately evaluate the impact of the intervention on different teacher groups, researchers need to include education, experience, and base pay as controls.

Stipends

To date, the research on pay stipends as a standalone form of incentive to support child care teacher retention has only been reported in academic literature twice (Bassok, Doromal, et al. 2021; Gable et al. 2007). In the study by Bassok, Doromal et. al (2021), the researchers performed a cash incentive experiment funded by a professional development grant to Virginia child care centers within a large suburban and metropolitan area. In this setting, 15% of center-based childcare teachers left their employer after 8 months if they receive a stipend of $1,500 as compared to 29% of center-based teachers who did not receive a stipend. The child care payment group was compared to a pay group of school-based ECE teachers, and the results showed the stipend had an even larger positive impact on child care teacher retention. Finally, the researchers examined schedule of pay, and found that paying three equally-distributed stipends adding up to $1,500 had a greater hold on teacher retention than paying the $1,500 stipend as a lump sum. The groups assigned at the start of the experiment were pre-determined by application, and there was no initial random assignment. The teachers within the group receiving the stipend were randomly assigned to receive different payment schedules. However, the work here sets up a precedent for examining the direct effect of cash incentives on child care teacher retention statewide, and the examination of the policy issue in Virginia may extend its lessons to Louisiana.

Current Study: Louisiana Child Care Teacher Supplemental Pay Pilot Program

In 2022, the Louisiana Department of Education (LDOE) led a program in partnership with the Kathleen Blanco Public Policy Center (Blanco Center) at UL Lafayette to provide grants to fund supplemental pay and study the effects of delivering a cash incentive to teachers in early learning centers throughout the state. All Type III centers participating in the Child Care Assistance Program (CCAP) were eligible to apply for grants under this fund to provide supplemental pay to full time teachers. To help stabilize the child care market, the LDOE allocated $20 million to the grant program. In addition to providing immediate support to child care centers and teachers throughout the state, the pilot program helped set the stage to measure the impacts of increased teacher pay on turnover.

Due to the number of applications relative to available funds, the centers were selected into the program using a randomization process that provides a solid foundation for exploring the causal relationship between pay and turnover with the following specific study goals:

- Estimate the effect of a supplemental pay increase on teacher retention
- Examine differences in teacher retention and pay with the receipt of a proportionate increase to base pay (10%) as compared to a lump sum supplement ($2080)
- Explore teacher retention in relation to fixed center-level or regional factors associated with job retention

Methodology

Center Recruitment

All eligible Type III early learning centers in the state were offered an opportunity to apply through a program announcement by LDOE. Centers were recruited from the announcements on the LDOE website, and through email from the LDOE and Blanco Center. Center owners or directors were then emailed a formal application outlining the terms of enrollment in the study and included requests to provide information on funding sources (e.g., % of funds given through CCAP, LA 4, Non-public school Early Childhood Development, LA B-3, Local Sources and Other). The application also outlined assurances that the director had to provide upon the condition that the center was selected for the study, which included the completion of all research data requests, proportional disbursement of funds to teachers following the center's regular payroll frequency until study completion, and notification of an audit for monitoring funds and documentation for the program.

Treatment Assignment and Dosage

A total of 559 centers with complete and valid applications were deemed eligible and a $1,000 stipend was set aside for all centers to support participation in answering follow-up surveys throughout the 2-year grant period. Subsequently, centers were randomly assigned to one of two groups to receive funds providing supplemental teacher pay until pilot funds were exhausted. A third group of centers did not receive funds for teacher pay increases. The teacher pay supplements directly increased hourly wages of teachers in the 2080 (i.e., $2,080) group by $1 (assuming full time year-round work of 2,080 hours), and for the 10% group by 10% of their base rate of hourly pay. Centers enrolled in the study were also provided additional funding to cover increased employer costs such as payroll taxes or fringe benefits costs associated with the additional pay. Centers that were selected into one of the two treatment groups were told that as a condition of participation in the pilot they would be required to disburse the supplemental pay throughout the year with the supplements given at least monthly (or more frequently following a regular payroll cycle).

Expected Treatment Sample Size

The sample size that was at a minimum needed to detect differences between treatment and control groups of centers was calculated from historical turnover data reported in past research. A diagram below outlines the different treatment scenarios that were anticipated, and the resulting minimum treatment sample size needed (see Figure 1). The chart below references three different turnover scenarios based on prior research. While these three benchmarks provided guidance on the minimum sample size needed to detect significant changes, there are limited data on the differing turnover scenarios, and thus the outcomes are hypothetical. A 46% turnover rate for the control group served as a baseline for turnover within a single year, as reported in a study on Louisiana ECE teacher turnover (Bassok, Markowitz, et al. 2021). The first treatment effect scenario of 37% represents what was found in another study of 2,000 Virginia teachers (Bassok, Doromal, et

al. 2021). Specifically the Virginia sample was teachers in two payment groups tracked for 8 months of turnover, and thus the difference between our control and treatment over one year could be larger. The second scenario used 34% turnover based on the UNC WAGE$ experiment (Clotfelter et al. 2006). The third scenario used 32% based on the reported effect observed in 300 teachers in the Virginia study comparing one payment to no payments (Bassok, Doromal, et al. 2021).

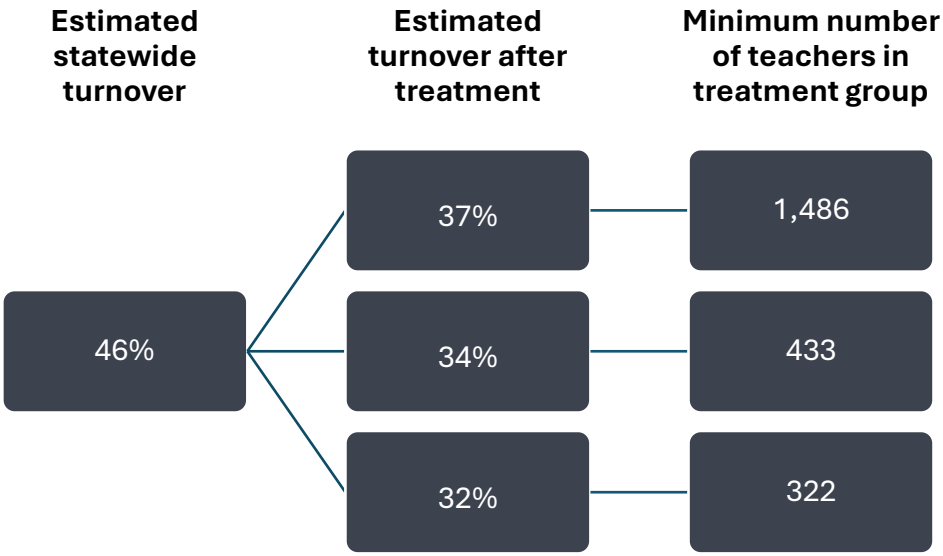

Figure 1. Estimated turnover rate scenarios and minimum treatment sample size

The treatment effect size differences between the baseline turnover level and the different treatment turnovers were calculated for the three hypothetical scenarios using G*Power (v 2.0). A power analysis on the first scenario comparing 46% control to 37% in the treatment group resulted in a Cohen's $h = .187$ ($1-\beta = .95$). Cohen's h of .20 has been considered a "small" effect, and discussion of any effects of the treatment reported at $|h| > .187$ would be found as practically significant findings. The resulting threshold for detecting a significant treatment effect was determined as 1,486 participants or roughly 1,500 teachers in the treatment group as the minimum number needed to detect an effect of the estimated magnitude. Due to the level of funding committed to the program, the ultimate sample of teachers was able to exceed the minimum sample sizes determined (see the results for more detail).

The centers enrolled in the study were from all LDOE regions (referred to as the Regional Management Area or RMA). The randomization process resulted in appropriate distributions by RMA (t-test of proportions < 1, $p = 1.00$).See the tables in the appendix for a detailed breakdown in the randomization outcome.

Treatment and Control Center Location

Centers assigned to treatment and control groups spanned 54 Louisiana parishes. Figure 2 displays the regional data of centers. As Figure 3 shows, centers were distributed across the state in proportion to their region, with more center concentration in higher population areas. These areas were in the southeastern portion of the state such as East Baton Rouge (n = 69) and Orleans parish (n = 56). Centers were classified as rural or urban based on the population density of their parish: 144 centers were classified as rural and 399 were classified as urban.

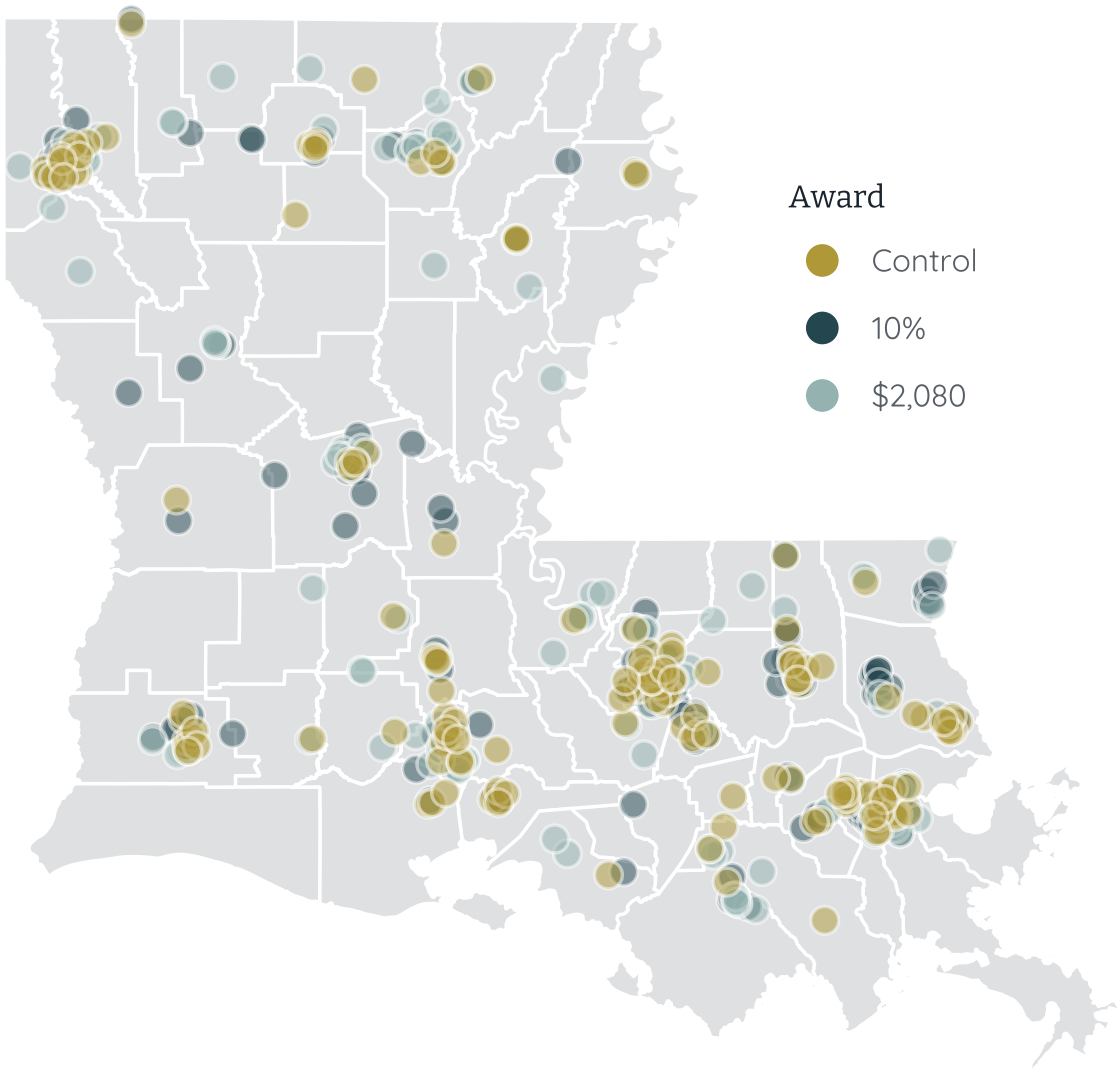

Figure 2. Center location in the state by treatment and control groups
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 544

Data Collection

The primary mode of collecting data from centers was an online survey using Qualtrics with email reminders and phone follow-up by Blanco Center staff to ensure completion and to complete quality control reviews of survey responses. An initial survey was distributed in June 2022 to collect application information used in initial funding determinations. Center license numbers and director contact information, including email and phone number, were collected to ensure follow-up surveys were received and completed.

Surveys to track retention and payroll of centers were distributed on a quarterly basis through Qualtrics for the duration of the grant from the last quarter of 2022 to the second quarter of 2024, resulting in a total of 8 surveys distributed over two years. The first survey requested the names of teachers participating in the pilot program with teachers required to individually opt in to participate and be eligible for the stipend. Treatment center directors were instructed to list the teacher's names and confirm teacher consent for participation. Due to rules around informed

consent and the expected difficulty in getting control group teachers to individually opt in to sharing personally identifiable information, directors of control centers were instructed to use pseudonym labels (e.g., "2 year old Room 1 Teacher 1") when listing out staff members and pay. Subsequent surveys through the final quarter (survey 8) asked directors to confirm which teachers were still at the center or if the teacher had left the center. Starting with the application data, each center's subsequent quarterly survey was pre-populated with the teacher information, and this was continuously updated based on data recorded in the prior survey when the director responded by checking off the status of each teacher at their center. Center directors also reported in every survey their teacher's hourly pay for all staff categorized as a full time teacher.

Surveys collected center-level, teacher-level, and payroll information in near-real time during the pilot program. From October 2024 to May 2025, the Blanco Center conducted a detailed follow-up verification process with centers to ensure the accuracy of teacher consent, participation, duration of time at their respective centers, and reported pay levels. Since each survey was administered at the end of a quarter, this amount was verified with center payroll data through calls.

Of the 579 centers that began the pilot program, 36 were removed during the pilot or after through the subsequent data verification process, representing 6% attrition over two years. Centers were excluded from the final dataset because they opted out after the program began, failed to meet contractual obligations, closed permanently, or had severe data-entry issues that could not be resolved due to closure or lack of responsiveness.

Data and Analyses

The primary measure of interest was quarterly turnover at the teacher level, which was captured in each survey when the director marked a previously-filled position as vacant or filled with a new teacher. Teacher hourly base pay was also captured in one variable, and a categorical variable captured assignment to the treatment vs control groups. Data files were formatted as teacher observations with repeated time points of the surveys administered, and dichotomous indicators for turnover. Teachers in each quarter also had center-level identifiers and data linked to their response, which were used in the regression analyses.

Award status—assignment to control, a 10% supplement, or the 2080 supplement—and reported hourly base pay were used to structure the overall data set for analysis. Teacher education, child care performance, and regional characteristics were later added to the data set used in baseline equivalence testing of the comparison between treatment and control groups, and for adding control variables to improve prediction estimates. These measures included data from administrative sources from LDOE from 2022-2024.[3] Teacher education was the center reported proportion of teachers at each level of education (associate's degree, child developmental associate's degree, bachelor's degree, master's degree). The data from LDOE were reported as average teacher performance by center assessed by the CLASS observational protocol, which includes measures of teacher emotional support, instructional support, and classroom organization, among others. The CLASS system rating assesses teacher performance by infant, toddlers, and pre-K levels. Center performance was reported at the center level. The state measure of center performance is an administrative policy implemented to provide a holistic assessment of Type III center quality, and provide centers with a path to improvement that is attached to increased staff bonus amounts and incentives (e.g., school readiness tax credits). The performance metric consists of several parts including CLASS assessment scores, fidelity to best practices (e.g.,

[3] 2023–2024 Site and Network Performance Profiles (Louisiana Department of Education).

child assessments, curriculum quality, accessibility to low-income families), and satisfaction surveys from families and teachers. The rating is converted into a numerical score ranging from 1-7 points, corresponding to unsatisfactory, approaching proficient, proficient, high proficient, and excellent. The numerical score was used for analysis. Center size, calculated by the average teacher count recorded between 2022 and 2024, was used in the analysis. In addition, poverty rate by zip code from the American Community Survey 5-year estimates were incorporated into the data set.[4] These data from the ACS U.S. Census Bureau were pulled using an API and linked to centers by their corresponding ZIP codes.

All data management, cleaning, and analysis were conducted in R (version 4.5.1). The tidyverse package was used for panel construction and data wrangling, while the survival package was used to construct survival objects and to estimate the Cox proportional hazards models. The final analytic data set consisted of 36,836 teacher-survey observations and 3,781 turnover events. The logistic model was estimated in R using the glm() function with a binomial logit link, and the survival model analysis performed in the "survival" package. Award categories were explicitly re-leveled so that results were expressed relative to the control group.

Results

Analytic Sample Characteristics

Records from 8,093 teachers observed between August 1, 2022, and July 30, 2024 were included in the analytic sample. Described here are the observed teacher pay data and group sizes by condition.

The overall pay of the sample was analyzed here to provide observational data on what ECE childcare teachers in the pilot were earning. Figure 3 displays the distribution of pay and notes measures of central tendency for the entire sample of teachers. Across the entire sample, the average hourly base level of pay was $12.07, with a median of $11.50 and a standard deviation of $2.97; wages ranged from a minimum of $7.25 to a maximum of $50.40. The black bars across the bottom of the figure indicate where 66% (thick bar) and 95% (thin bar) of the data fall.

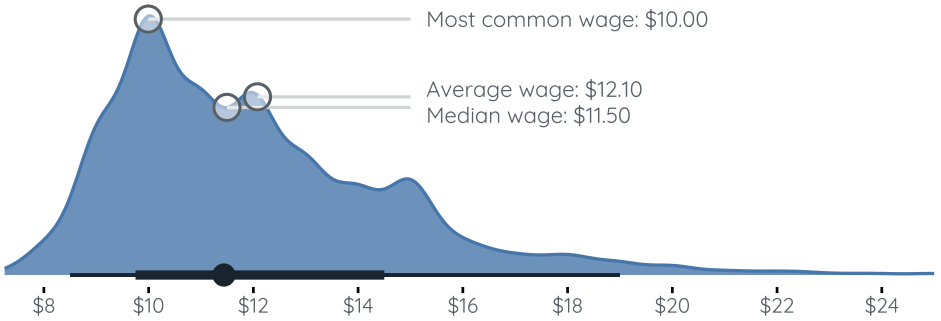

Figure 3. Pilot teacher hourly wage distribution across the sample
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 8,093

[4] Demographic characteristics of the state included total population by zip code, household income by zip code, and poverty rates by zip code. Data were estimated based on the *American Community Survey: Selected social characteristics in the United States (5-Year estimates data profiles, 2019-2023)*. (2023). United States Census Bureau.
https://data.census.gov/table/ACSDP5Y2023.DP02?g=040XX00US22&tid=ACSDP5Y2023.DP02

Wage levels observed by award group showed modest variability. Teachers in the 10% supplement group earned an average of $12.49 per hour in base pay (median = $12.00, SD = $3.19). Those in the $2,080 group averaged $11.57 in base pay (median = $11.00, SD = $2.63). Teachers in the control group earned an average of $12.18 (median = $11.42, SD = $3.03).

Total size of the treatment and control groups were roughly equal. In the 10% supplement group, 2,732 teachers received a 10% increase to their base hourly pay. In the $2,080 group, 2,878 teachers received pay supplements throughout the year equivalent to an annual sum of $2,080. The control group totaled 2,469 teachers.

Across all monitored centers, there were an average of 8.52 teachers per center, a median of 7 teachers per center, and a range from 1 to 41 total teaching staff. By award group, the 10% supplement group averaged 8.70 teachers per center, the $2,080 group averaged 8.54 per center, and the control group averaged 8.30 teachers per center.

Preliminary Analyses of Pilot Groups

Baseline Equivalence of Treatment and Control

As described earlier, the observational data indicated roughly equal group sizes for comparisons. In this section, the teacher and center-level data are broken down by award and control groups to describe the statistical baseline of teacher data prior to the observation of teacher treatment effects.

We tested for baseline equivalence across variables intentionally selected as important to wage supplement studies (Bassok, Markowitz, et al. 2021; Gable et al. 2007); award groups for average base pay of teachers, average teacher counts per center, and selected center-level characteristics were assessed. First, normality was evaluated for each continuous variable using the Shapiro–Wilk test on the pooled sample, as an initial diagnostic of distributional shape. Non-significant results ($p \geq 0.05$) provided no evidence against normality, whereas significant results ($p < 0.05$) indicated departures from normality. All examined predictor distributions resulted in p values well below 0.05, indicating their distributional shapes varied significantly from normality. Review of group-wise histograms and summary statistics confirmed the results of statistical tests and informed the decision to use nonparametric methods for baseline comparisons.

To statistically compare the treatment and control groups, we performed a non-parametric Kruskal–Wallis (K-W) test on all covariates included in the analyses. The K-W test is an approach used for detecting baseline differences that could confound statistical comparisons of treatment and control groups on covariates included in regression models explaining turnover. Results showed that only base pay of teachers was found to be significantly different between award groups (Kruskal $p < 0.05$), suggesting that the base pay of teachers in the 10% group tended to be higher than the other award groups. The effect size of this difference was small, however, and not considered large enough to influence the results of the regression analysis. See the full table of results evaluating the baseline equivalence in the Appendix.

Turnover Trend Analyses

Of the 7,834 teachers participating in the study with an opportunity to turnover (teachers who entered the pilot in the final quarter for their centers were not counted), 3,781 (48%) left their center and did not return during the study period. The reported 2-year turnover estimate has some qualifiers. Some teachers went on parental leave or temporarily dropped below 30 hours, causing

them to disappear from survey data but later reappear. There were also teachers who may have switched classrooms or teacher positions to fill in temporarily. Turnover was coded only when a teacher permanently left the center, rather than temporarily reducing hours or taking leave.

Turnover patterns are reported in two ways: cumulative turnover across the two years and quarterly turnover rates at three-month intervals. Cumulative and quarterly turnover are calculated with different denominators referenced. Cumulative turnover is calculated against the total number of teachers who ever began or entered the pilot during the study period. In contrast, quarterly turnover rates reflect the number of teachers who left in each quarter (i.e., those who did not appear in the subsequent survey), divided by the total number of teachers employed during that specific quarter. Because hiring and departures fluctuated across centers over time, the denominator—and therefore the rate—varies for each quarter. Teachers who entered the pilot during the final survey period were excluded from analysis, as they did not have sufficient opportunity to leave before the pilot ended.

Figure 4 shows turnover trends for all teachers involved in the pilot. Figure 5As observed, the data show that turnover levels reached at two years was around 48%, which is less turnover than expected overall, but still remains on track with turnover trends in the state. Quarterly turnover rate was highest at 12 months (Q4). Due to the timing of the pilot program, the Q4 data corresponded to May through July 2023, capturing teachers who left during the summer. A higher number of teachers may have transitioned at this time due to seasonal factors. Some ECE centers follow an annual cadence that aligns with the elementary school year with reduced service during the summer, or changes in family needs of teachers occurred such as their own children progressing from an ECE setting to elementary school.

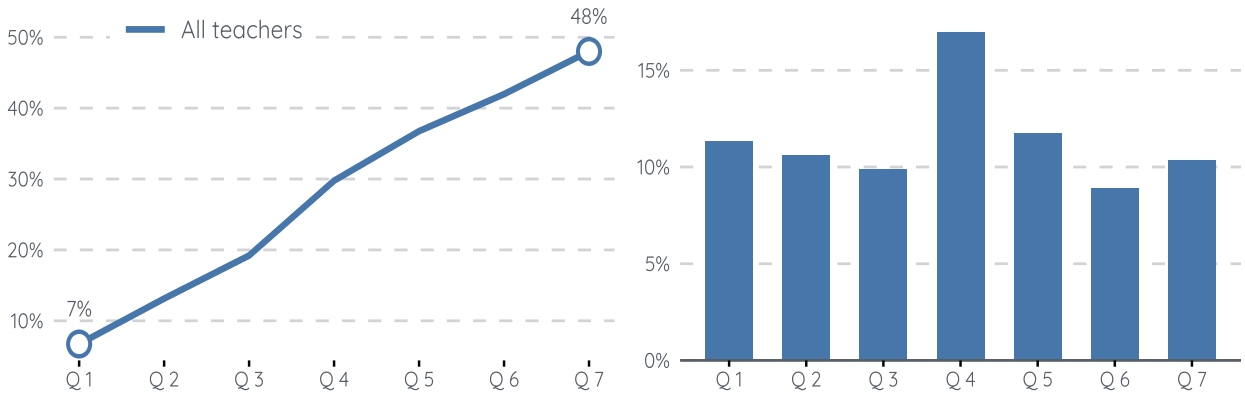

Figure 4. Teacher turnover measured quarterly for two years
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 7,834

Figure 5 shows turnover trends by treatment group. The 10% group ended the pilot with the lowest turnover rates, however, in comparison with the control group the difference was minimal with the cumulative turnover rate only 2% less than that of the control group. The 2080 group ended 2% higher than the control group in cumulative turnover but again, the difference was considered relatively small. That being said, the lower average rate of pay for teachers in the 2080 group was found to be statistically significant in comparison to both the control and the 10% group. That lower rate of pay may have contributed to its cumulatively higher turnover rate and will be examined more closely in the main analysis.

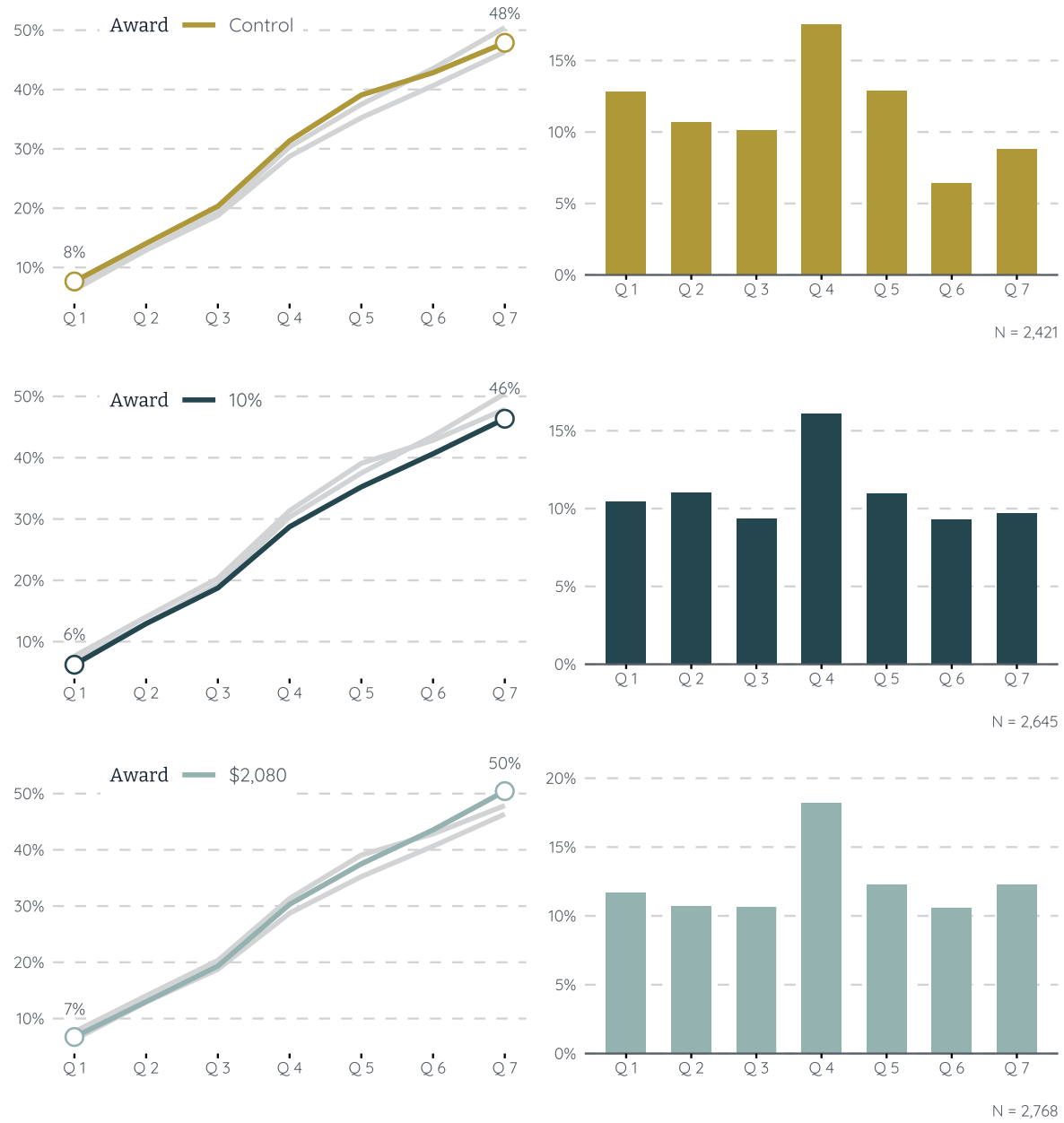

Figure 5. Teacher turnover measured quarterly for two years by award group
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 7,834

Associations among Predictors

After determining baseline equivalence between the treatment and control groups, the next steps toward conducting regression analyses involved obtaining models of predicted turnover from group assignment, wages, and other covariates. As described earlier, center-level characteristics were examined across LDOE administrative data sets on center level performance and teacher education, as well as data on community-level economic and demographic factors. The data selected included center performance (variable: *performance score*), education (variable: *percent of teachers with no degree*), center capacity (variables: *average teacher count*), and surrounding economic conditions (variable: *poverty rate by zip code*).

Predictors ultimately included in regression analyses were narrowed down by first removing non numeric variables, variables with a high degree of missingness, irrelevant or redundant predictors to the study, and variables representing scores (e.g., criteria for center ratings) that could cause information loss from binning, unjustified linear spacing assumptions, and potential multicollinearity within each model. Then correlations were examined on the remaining variables to be included in the model in order to examine any additional issues with collinearity.

Multicollinearity tests included analysis of pairwise Pearson correlations among center-level predictors (R, corrr package) and variance inflation with Variance Inflation Factor (VIF) estimates provided in each regression model. Correlations computed as high pairwise associations were flagged at $|r| \geq 0.70$. VIF estimates higher than 5 were flagged. Overall, the correlations estimated have a degree of collinearity that was expected among normally overlapping characteristics of ECE childcare centers. Centers typically at higher performance levels were higher on observed teacher-child interaction ratings. Moreover, centers with more degreed teachers had staff that were generally more certified in areas of child development.

Overall, these factors examined in each output did not present problems with interpreting the regression results. All VIF values were below threshold, indicating no concerning collinearity, and further supporting interpretability of coefficient estimates. Detailed outputs of the collinearity tests are presented in the Appendix.

Regression Analyses

The following section is dedicated to regressions analyzing predicted turnover in the starting cohort of teachers (August 2022). First, a series of logistic regressions are presented to examine the potential effect of supplemental pay on any turnover during the pilot. Two logistic regression models are used: a) ignoring treatment to examine the general predictive trend of turnover by teacher hourly base pay, and b) examining turnover by supplemental pay and control groups. Finally, a series of Cox proportional hazard models are used to examine the treatment effect while accounting for time to the turnover event.

Logistic Regression of Turnover onto Pay Across Teachers

The data were examined for the August 2022 entry cohort for several reasons. The first reason was to provide a comparable starting point for observing the turnover event, and to provide a clearer picture of the pay-turnover relationship in which pay is examined before turnover. In addition, there were teachers hired into the pilot after August 2022. Thus, there may be some differences expected in cohorts of teachers based on when they were hired (e.g., different motivations, self-selection into centers offering higher pay), as well as teacher experience of the wage supplement from year to year (e.g., a stronger effect in Year 1 compared to Year 2). Figure 6 is a summary of a logistic regression that estimates the probability of turnover as a function of hourly base pay while controlling for center performance, average teacher count, the share of teachers without a degree, and zip code poverty rate. The line in the plot shows the predicted probability of turnover across the observed pay range. As the line declines with higher pay, it illustrates the model's core result: higher hourly pay is associated with lower odds of turnover after adjusting for center characteristics.

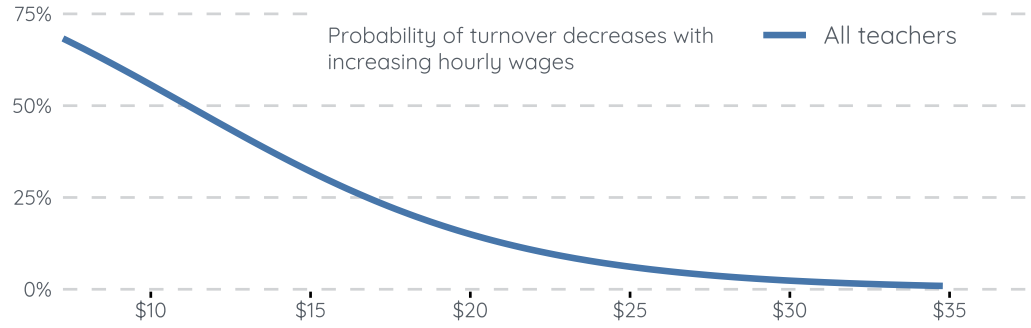

Figure 6. Probability of teacher turnover regressed onto hourly wages

Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 4,613

In conjunction with the trend visualized above, a more complete set of results from the logistic regression model are presented as odds ratio estimates in Table 1. The odds ratio less than 1 for average teacher pay is consistent with the trend that turnover was lower at higher levels of hourly pay (approximately an 18 percent reduced odds on average). The estimates also revealed that a higher level of center performance is associated with lower turnover, a higher number of teachers per center is associated with slightly higher turnover, and a higher share of teachers without a degree at a center is associated with higher turnover risk. Finally, a higher poverty rate by zip code was associated with a large decrease in the odds of turnover, though only marginally significant. This result may indicate that relative to areas of lower poverty, areas of higher poverty rate tend to have fewer employment opportunities.

Table 1. Regression of turnover on teacher pay, center-level characteristics, and poverty rate

Characteristic	OR	95% CI	Sig.
Average teacher pay	0.82	0.80, 0.84	< .001
Center performance score	0.72	0.62, 0.82	< .001
Average teachers per center	1.02	1.01, 1.03	< .001
% Teachers with no degree	1.51	1.23, 1.87	< .001
Poverty rate by zip code	0.46	0.23, 0.93	< .05

Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 4,613
Abbreviations: CI = Confidence Interval, OR = Odds Ratio; Sig. = p-value significance

Logistic Regression of Turnover onto Pay by Award Group

Figure 7 is a visual summary of the second model that focuses on the effect of pay on retention by treatment assignment and plotting a separate line for each award. Each line shows the predicted probability of turnover across hourly base pay while controlling for center level characteristics.

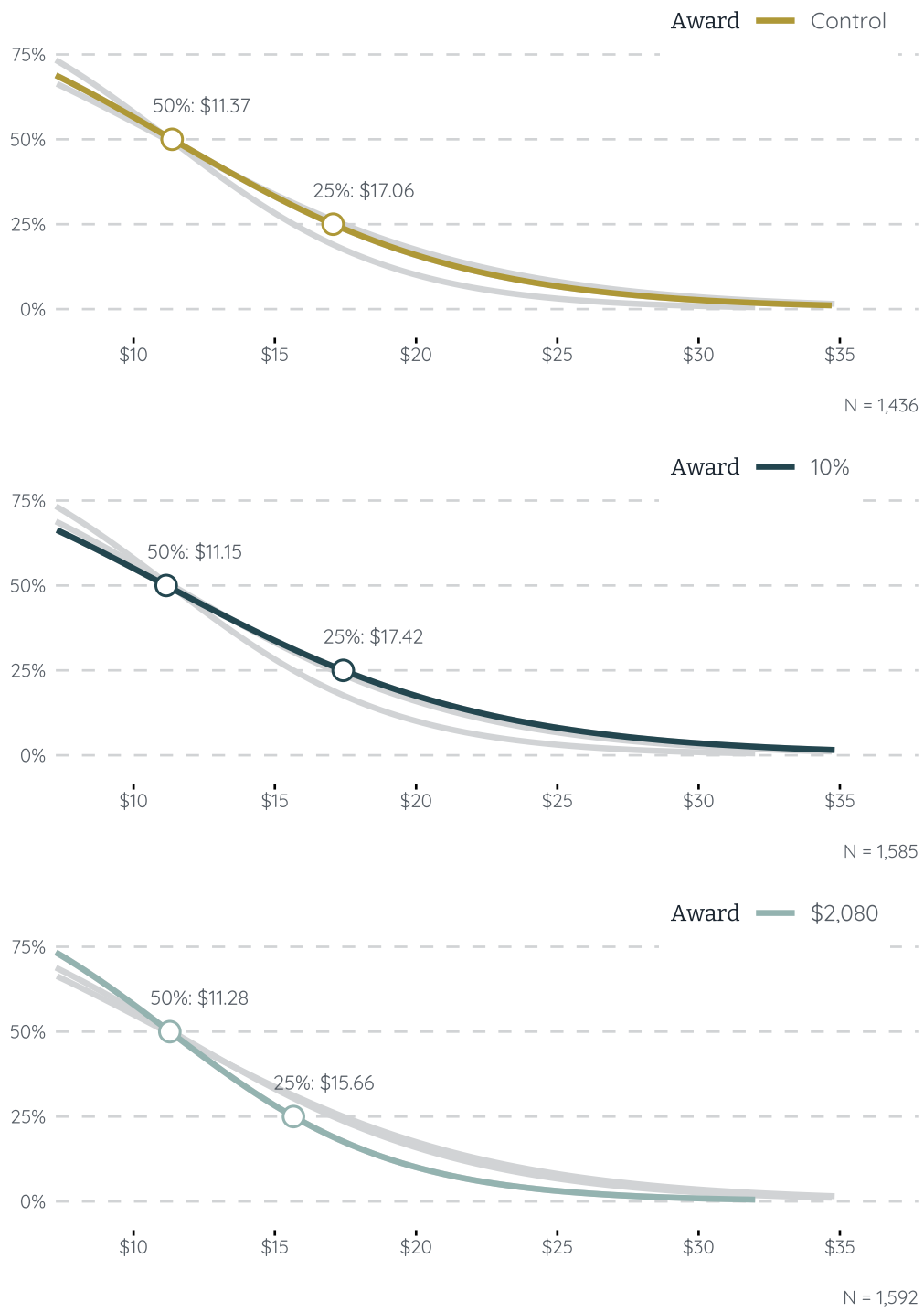

Figure 7. Probability of teacher turnover regressed onto hourly wages by award group
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 4,613

The estimates of turnover by group are reported below in Table 2. The analyses show that teachers experiencing the 10% or the $2,080 supplement did not differ significantly from the control group when center covariates and poverty level were held constant. The results of the model that was factored by group did not differ in a substantive way from the model that ignored group assignment.

Table 2. Regression of turnover on treatment, teacher pay, center-level characteristics, and poverty rate

Characteristic	Odds Ratio	95% CI	Sig.
Control	—	—	
10% Treatment	1.01	0.87, 1.18	no
$2080 Treatment	0.91	0.78, 1.06	no
Average Teacher Pay	0.82	0.80, 0.84	<.001
Center Performance Score	0.71	0.62, 0.82	<.001
Average # Teachers per Center	1.02	1.01, 1.03	<.001
% Teachers with no Degree	1.54	1.25, 1.90	<.001
Poverty Rate by Zip Code	0.47	0.23, 0.95	<.05

N = 1,571
Abbreviations: CI = Confidence Interval, Sig. = p-value significance

In summary, the logistic analyses results obtained include significant associations of base pay with odds of turnover. The assignment to an award group was not associated with differences in turnover odds. However, the logistic regression model approach involves collapsing turnover data across all events and cannot account for time to the turnover event. Thus, the survival analyses are presented to incorporate exposure length and timing of turnover from start to finish.

Survival Analyses of Turnover

A Cox proportional hazards model was performed to account for time through paneled data. The focus of the survival analyses is to assess whether turnover risk (hazard of teacher exit) differs between treatment and control groups over the course of the quarterly time points. A hazard ratio (HR) is used in the model to estimate the time course of turnover of teachers, and the data on treatment and control groups can be compared on survival risk. A HR < 1 would mean that treatment teachers tended to remain on the job longer than control teachers. This turnover risk is the inverse of the employment story: the teachers in the pilot who remained employed from one quarter to the next would still be considered at risk of termination in the survival framework, whereas teachers who were observed in one quarter and then no longer employed the next were no longer at risk, regardless of when they exited in the quarterly time point they were first observed.

The main analysis was performed on the baseline August 2022 cohort entering into the pilot. Additional analyses were performed on the full sample of teachers including teachers entering later in the pilot who had progressively less time to leave before the pilot ended. Another separate set of analyses included only teachers in the first year of the pilot. All samples of teachers analyzed were evaluated in the following order: treatment vs control alone; treatment and control groups adding base pay as a control; treatment and control groups controlling for base pay, center-level, and area characteristics. Additional decisions regarding the data are described in the next sections.

Proportional Hazards

An important assumption of survival analyses is that all groups in the study had proportional hazards over time. This assumption was evaluated for all independent variables and revealed that one of the predictors, percent of teachers with a degree, was significant. However, a visual inspection did not reveal that there were meaningful differences between the groups on the proportionality of their hazard rates. Thus the survival rates comparing each treatment group to the control can be thought of as a direct comparison, and survival rates over time interpreted similarly.

Censored Data

Survival models can accommodate censored data, which occurs at the end of a longitudinal data collection effort when an person's employment status is not known beyond a certain period of time. Rather than discarding teachers for whom a final status is not known, data are treated as censored so that their observed duration of retention contributes to the analysis, without incorrectly classifying them as having either turned over or remained permanently in the final period of observation. This approach is a key strength of survival analysis relative to logistic regression, as it properly accounts for unequal observation windows and prevents bias in the estimation of turnover risk.

Teachers were observed from entry until either a turnover event occurred, or they reached the end of the study period. Records for teachers who were still employed at their centers at the end of the study period, or if their center did not report data in later quarters due to center attrition or other data challenges noted previously, were considered right-censored because the true length of time to turnover was extended beyond the observation window.

Frailty

Frailty models include a random effect, and the variance of that effect quantifies unobserved heterogeneity within the model. Unobserved heterogeneity refers to unmeasured center-level factors in our study that affect turnover risk. A frailty term accounts for residual variation not explained by observed covariates and is represented as omega (Θ) with higher values meaning an elevated risk due to unobserved differences.

Clustering

Assumptions of the independence or dependence of our data have also been built into model iterations. In time-structured survival data, turnover observations from the same child care center might not be truly independent because they share the same work environment. To address this, we adjust standard errors for within-center correlation using a clustering variable in the survival model. Unlike frailty, clustering does not estimate center-level variance or introduce a random effect. Instead, it adjusts only the precision of our model estimates to reflect the fact that teacher outcomes within the same center may be correlated. This adjustment helps ensure that statistical inference (e.g., p-values and confidence intervals) is not overly optimistic due to the assumption that observations for each teacher are completely independent.

Survival Model Estimates

Baseline Cohort

The following results are specific to the baseline cohort of teachers entering the beginning of the study at assignment to treatment. In Table 3 below, the treatment effects are presented for the different models run with additional controls included in the model as denoted by an X in the

lower rows of the table. For a full set of estimates of the baseline cohort, see the Appendix. The first model provides a direct test of the treatment effects, comparing the two pay groups to control group, without any additional covariates. The resulting effects show no significant differences in turnover between treatment and control.

The second model controls for teacher base pay recorded across quarters, and shows no significant differences in turnover between groups, but finds that the association between turnover and average teacher pay was significant and in the expected direction of lower turnover risk with higher levels of pay (see Table 3 below).

The third model showed no significant treatment effect, but additional covariates were significant. Higher center performance was associated with lower risk of turnover. Having more non-degreed teachers and lower levels of area poverty were associated with higher turnover. Larger average teacher staff was associated with higher turnover in one model.

Table 3. Cox proportional hazard models of turnover in the baseline cohort (no clustering and no added frailty term)

Model Effects	***Model 1***	***Model 2***	***Model 3***
Treatment vs Control	**HR (SE)**	**HR (SE)**	**HR (SE)**
10% Treatment	0.946 (0.055)	0.983 (0.055)	0.981 (0.055)
$2080 Treatment	1.023 (0.054)	0.983 (0.054)	0.920 (0.055)
Average Teacher Pay		X **	X **
Center Performance Score			X **
Average # Teachers per Center			X **
% Teachers with no Degree			X **
Poverty Rate by Zip Code			X *

Abbreviations: HR = Hazard Ratio; SE = Standard Error; X = covariate included in the regression model
*p-value of estimate < .05, ** p-value of estimate < .01

Table 4 displays the results of the survival models run using clustered standard errors. This did not result in a change in the significance of the treatment effects or added covariates. In the fourth model, we included a center-level frailty term, revealing significant unobserved heterogeneity across centers, and indicating that there may have been other contributing factors to the variation in risk of turnover between centers external to what was observed with the covariates in the current model.

Table 4. Cox proportional hazard models of turnover in the baseline cohort with clustering or frailty term

Model Effects	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Treatment vs Control	**HR (SE)**	**HR (SE)**	**HR (SE)**	**HR (SE)**
10% Treatment	0.94 (0.055)	0.983 (0.055)	0.981 (0.055)	1.012 (0.085)
$2080 Treatment	1.023 (0.054)	0.983 (0.054)	0.920 (0.55)	0.921 (0.085)
Covariates				
Average Teacher Pay		X **	X **	X **
Center Performance Score			X **	X **
Average # Teachers per Center			X **	X **
% Teachers with no Degree			X **	X **
Poverty Rate by Zip Code			X	X
Clustering				
Clustered standard errors	yes	yes	yes	no (substitute frailty term)
Additional Variance				
Frailty variance (center-level)				X**

Abbreviations: HR = Hazard Ratio; SE = Standard Error; X = covariate included in the regression model
*p-value of estimate < .05, ** p-value of estimate < .01

All Cohorts

Table 5 summarizes an analysis with the complete data set of teachers hired during the pilot. Estimates of turnover due to the treatment slightly increased with the inclusion of later entering teachers into the model, but results remained insignificant across models. The addition of a frailty term revealed significant unobserved heterogeneity between centers, suggesting that center-level factors not captured by model covariates could have influenced turnover risk between centers. Adjusting standard errors for clustering at the center level did not alter model estimates in any meaningful way suggesting that the model estimates are accurate.

Table 5. Cox proportional hazard models of turnover for the full sample of teachers with clustering and frailty terms included

Model Effects	***Model 1***	***Model 2***	***Model 3***	***Model 4***
Treatment vs Control	**HR (SE)**	**HR (SE)**	**HR (SE)**	**HR(SE)**
10% Treatment	0.964 (0.041)	1.017 (0.041)	1.011 (0.041)	1.086 (0.080)
$2080 Treatment	1.091 (0.040)	1.034 (0.040)	0.955 (0.040)	0.998 (0.079)
Covariates				
Average Teacher Pay		X **	X **	X **
Center Performance Score			X **	X **
Average # Teachers per Center			X **	X **
% Teachers with no Degree			X **	X **
Poverty Rate by Zip Code			X	X *
Clustering				
Clustered standard errors	yes	yes	yes	no (substitute frailty term)
Additional Variance				
Frailty variance (center level)				X**

Abbreviations: HR = Hazard Ratio; SE = Standard Error
*p-value of estimate < .05, ** p-value of estimate < .01

Baseline Cohort Year 1

Table 6 summarizes results from a set of analyses restricted to the first year of teacher observations using the baseline cohort from August 2022. This time period was analyzed to ensure that any variation in turnover with a finite, 2-year time horizon for the supplemental pay would not attenuate the treatment effect. Examining the treatment effects shows that in the first model with treatment only, turnover risk was lower in the 10% group than the control group, but this difference was not significant in any of the models analyzed. Turnover risk for the 2080 group was also only slightly below the control group, but not significantly different. Thus, the treatment estimates were not more sensitive to differences in the first year with baseline cohort teachers.

Table 6. Cox proportional hazard models of turnover for baseline cohort within the first year, with clustering and frailty terms included.

Model Effects	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Treatment vs Control	**HR (SE)**	**HR (SE)**	**HR (SE)**	**HR (SE)**
10% Treatment	0.913 (0.072)	0.952 (0.072)	0.942 (0.072)	1.002 (0.108)
$2080 Treatment	0.980 (0.071)	0.936 (0.071)	0.854 (0.072)	0.850 (0.108)
Covariates				
Average Teacher Pay		X **	X **	X **
Center Performance Score			X **	X **
Average # Teachers per Center			X *	X **
% Teachers with no Degree			X **	X **
Poverty Rate by Zip Code			X	X
Clustering				
Clustered standard errors	yes	yes	yes	no
Additional Variance				
Frailty variance (center-level)				X**

Abbreviations: HR = Hazard Ratio; SE = Standard Error
*p-value of estimate < .05, ** p-value of estimate < .01

In summary, there were no reliably detected significant treatment effects on quarterly turnover. These results were established through evaluating the treatment effect over different variations of models including the baseline group of teachers, the full sample, and just including observations in the first year of the pilot. A number of additional covariates within the model helped to explain some of the variation of teacher-level turnover. By using center-level and aggregated teacher-level data, the patterns emerging suggest that average teacher pay and center-level characteristics measured contributed significant but small to medium effects on teacher turnover. Local poverty rates showed a smaller and less consistent effect. Unobserved heterogeneity between centers contributes to the differences in center turnover. Clustering center-level data did not alter the estimates of turnover.

Discussion

Summary of Findings

We studied the impact of early educator compensation measures on ECE teacher retention within Louisiana. The pay stipend strategy was expected to yield reductions in turnover at treatment centers, an outcome consistent with providing immediate support to teachers receiving supplemental pay and market wide stabilization. Overall, the evaluation did not find evidence that

the pay supplement implemented during the pilot was associated with improved teacher retention. Turnover varied from quarter to quarter during the study period, with cumulative teacher turnover reaching approximately 48 percent among those who entered the pilot between August 2022 and April 2024. Analyses were examined across a variety of scenarios, and through these we did not find that teacher turnover differed significantly between the control group and the two treatment groups.

Exploring the data for covariates, we observed in our regression analyses that retention was correlated with hourly pay, and with other factors of center performance and education levels of staff, with some of the findings consistent with the anticipated outcome. We observed that lower turnover tended to occur among teachers with higher wages and other factors associated with center performance. However, this cross-sectional variation points to a larger influence of labor demand factors (i.e., higher compensation for more experienced or higher quality teachers) rather than supply side factors given that the random assignment of additional pay within a range of approximately $1 per hour did not appear to influence turnover in a meaningful way.

Among other covariates, center performance score factors calculated for state child care providers, and which are based on evidence-based metrics (e.g., CLASS assessment data, education data by child development associates, bachelor's or master's degrees) were found to be associated with retention, which is consistent with prior literature (Bassok, Markowitz, et al. 2021; Gable et al. 2007). In addition, we observed some unique findings in our study, namely that smaller centers as well as centers with a higher proportion of teachers without a degree were correlated with higher teacher turnover. Specifically within education, we found that the number of teachers without a degree resulted in the largest effect size of the covariates, at 1.5 times the odds of baseline turnover. Our observations, while not causal, are consistent with prior literature on ECE teacher pay, performance, and retention. Center-level factors have to be taken into account with teacher pay, because these factors of ECE quality could contribute to perpetual turnover (Whitebrook and Sakai 2003; Doromal et al. 2022).

We also introduced the assumption of a frailty model and clustering of observations within the survival analysis. Frailty is a term used to measure any potential differences between centers in our sample that could not be explained by the indicators included in the survival analyses. Introducing frailty, the model results indicated that unexplained differences between centers contributes significantly to turnover, and these differences could be due to characteristics about the centers that we did not measure. Using a frailty model is recommended in survival analyses by Balan and Putter (2020) who argue that a frailty term helps to capture the correlation in turnover risk arising from hidden characteristics in the sample that make groups of observations different from the outset. Center-level turnover for a variety of complex reasons is well-documented, as discussed earlier, and including a frailty term introduces a more realistic consideration that teachers from the same center may experience more similar risks of turnover due to the characteristics shared within the center they are employed. Extrapolating this argument, the risk of turnover may be significantly influenced due to the culture of a center, or common economic, social, or other community factors experienced by teachers employed at the same center.

Study Implications

Despite finding no effect of the treatment, this study provides new insights into child care teacher retention that may be attributed to teacher pay, center performance, and other external influences due to labor market conditions.

Teacher Hourly Pay

Teacher pay in child care centers is notably low relative to economy-wide benchmarks, and this study provides a new, rich source of data characterizing teacher wages in Louisiana. Compared to other ECE settings (Headstart, public pre-K), teachers in child care centers typically do not receive employment benefits or earn enough to no longer be dependent on public benefits (Whitebrook 1999; Burton et al. 2002). Moreover, data from the Bureau of Labor Statistics shows child care salaries lag teachers serving the elementary school population (see Appendix for salary comparisons of child care and elementary teachers). Our study results show that most teachers could expect to make around $10-12, some may make up to $20-25, and others are below $9. These levels of pay are low compared to national benchmarks, which show child care teachers making approximately $12.4 an hour as per current BLS data.

While the central treatment of increasing pay for randomly selected groups did not produce significant changes in turnover, we nevertheless found an underlying correlation between pay and turnover. It might be that pay is a driver of turnover, but turnover may also be a driver of pay, such that teachers who are staying longer receive more opportunities for higher salaries. Among all Type III early learning centers enrolled in the study, there were clearly observed differences in the likelihood of teacher turn over at different wage earning levels. Yet, the data show only that given a level of wages, on average the likelihood of turnover would be higher or lower relative to another level of wages. The data do not speak to a direct increase or decrease in earnings as the cause of retention. The association we found should not overstate the conclusion, nor does it mean that an increase in wages is a single contributor to the reduction in turnover. Rather, this association may be caused by centers providing raises in response to increases in teacher experience, or that other factors such as teacher quality or teacher motivation influence both retention and pay over time.

Center Performance

In the context of this pilot program, we found that center performance score, as measured by LDOE's composite of teacher and center quality, shows a stronger association with retention than pay. Higher ratings were associated with lower turnover odds between 22% and 26% (depending on the model) with each point increase in ratings. While not a causal factor driving retention on its own, an important note performance measures weigh multiple factors, and an increase of one point could be driven by a wide range of factors. Compared to lower performing centers, the higher performing centers possibly gave staff more reasons to stay than just pay incentives at this level, or that those unobserved factors interact with pay in ways not captured by this study. We found in the literature that the factors associated with center quality could be shaped by a balance of increased pay, organizational policies that support teachers, and cultural climates that make a center environment desirable for staff to work and live (Whitebrook and Sakai 2003; Polito 2023).

Another factor influencing center performance involves state policy connected to center performance. Currently, Louisiana ties center performance to quarterly bonus payments and benefits for Type III early learning centers. These centers can receive up to 23% quarterly bonus for achieving higher quality ratings assessment. There are added incentives such as the School Readiness Tax Credit to teachers, directors, and families, as well as credits toward professional development and licensure testing for centers with higher quality ratings (Louisiana Department of Education 2024). Overall, these factors encourage centers to strive for higher quality and mitigate potential turnover problems.

Teacher education

The current study also reinforces an important association between teacher education and retention. Centers with a higher share of degreed teachers experienced lower turnover, a pattern consistent with prior research showing that more educated teachers tend to remain in their roles longer (Bassok, Markowitz, et al., 2021). At the same time, it could also be that higher paying centers are able to recruit more educated and qualified teachers. Data indicates that this relationship depends on the center. For example, a national sample of highly trained teachers may be more likely to leave when they work in centers with relatively few similarly educated colleagues, suggesting that workplace composition and peer dynamics also play a role (Whitebrook & Sakai, 2003). In our study, the proportion of teachers with any formal credential was consistently correlated with retention, and this association held across different measures of education, including the CDA. However, education is likely also functioning as a proxy for broader factors rather than acting only as an isolated causal driver. For this reason, the influence of education on turnover cannot be interpreted in the same way as other determinants such as pay levels or local labor market conditions, as each reflects a distinct mechanism through which retention may be shaped.

Macro-level Causes

The COVID-19 pandemic was very disruptive for centers and made working as a child care teacher more challenging in a variety of ways. There is also evidence that the pandemic and the public response had a large and positive impact on wages for many occupations at the low end of the income distribution. Researchers using the Current Population Survey (Gould et al. 2025) credit policy makers for making a major infusion of wages after the pandemic. These changes had the greatest impact on workers at the lowest end of the distribution (10%), where typically disadvantaged communities are affected. This infusion in the wake of the pandemic, as with the relief funds that were utilized in the study, may have presented opportunities for workers to find jobs in other service sectors within that period that we could not observe.

The pandemic also caused major disruptions to center operations and may have influenced the workforce participating in the pilot due to a recent history of forced closure and layoffs across the sector. This study examined the period of retention when many centers were just returning to normal, and many had experienced closures.

Types of Evaluation

Prior program evaluations of cash incentives in child care have key differences from the current evaluation (Gable et al. 2007; Bassok, Doromal, et al. 2021). There were differences in the evaluation design from this Louisiana pilot, and a different intensity and timing of the intervention from this administration. The prior studies used a quasi-experimental design (QED) which is performed by locating a statistical comparison group separately from the context in which the experiment was conducted. A QED employs the approach of structured evaluation like an RCT, but must rely on retrospective control data drawn from a different time or place socially and economically, which can introduce bias if not done carefully, or if unobserved differences between the treatment group and the control group identified are important factors. Biases can also result from when a new treatment is compared to a sample that may have data from overlapping samples (i.e., lack of independence between groups) where programs ongoing at the time of the evaluation cannot be fully isolated in the effects. Another difference within these studies lies in the dosage intensity and timing, all of which are different between the prior studies. Notwithstanding the differences, there are some limitations of drawing conclusions from the current study.

Limitations

The limitations of the current study regard survey-based reporting, the level of intervention, and center variability in the data. In particular, the evidence of our study was derived from surveys reported by the center director, which were distributed every quarter. However there were gaps due to missing data that had to be recovered through follow up calls and verification. Centers may have changed owners and may have had teachers who left and came back that were not accounted for in an exhaustive way in the survey. The data verification effort may have helped to recover some of these reporting issues, as research staff walked through each teacher on the list to ensure all staff were accounted for. However, we cannot be entirely sure that all center directors reported all teacher data accurately.

The size of this pilot intervention did not produce a significant change in turnover. Beyond conclusions summarized above, the study does not provide information about how larger changes in pay might affect retention. Studies of teacher retention over a shorter duration have shown larger effects of turnover. Given the often-extensive turnover problems of centers, a longer term observation of teacher turnover was needed.

A final consideration of the study design is the finding of significant unobserved factors at the center level influencing teacher turnover. We found that centers differed in significant ways with respect to their turnover risk, and these differences could not be fully explained with teacher-level, or center-level covariates. To account for this we used a frailty term (i.e., random effects) in some survival models, which allowed each center to have its own baseline propensity for turnover. The significance of the frailty term across models suggests that additional, unmeasured center characteristics, such as management practices, staffing policies, scheduling stability, or local labor market conditions, may be driving retention differences. There may be opportunities for future studies to incorporate additional targeted data collection to better explain these center-level differences in retention.

Future Directions and Recommendations

While the findings from this pilot study indicate that a supplemental pay stipend of approximately $1 per hour did not have a significant effect on teacher retention, but additional research can help further illuminate choices that workers make between jobs and how pay or other non-wage attributes might influence those decisions, such as the strong motivation of some child care workers to remain despite low wages (Torquati et al. 2007). Another potential route for future study would be the use of administrative data to include individual teacher quality, wage records that can incorporate all employees of child care centers and identify when teachers leave. This type of data could be a helpful source of information on the industry and occupation that workers move into when leaving a child care center as well as an understanding of where new teachers come from. Future work could also focus on comparing centers within different regions and using other types of quasi-experimental designs to better control for regional differences . The randomization process used in this pilot produced equality among the groups statewide, but the evidence within regions may point to the need to focus on urban concentrated vs rural concentrated areas or at least illuminate better some of the underlying dynamics within regional labor markets. Furthermore, the work that moves forward from this will need to observe retention in other sectors that are comparable to child care industries to determine the best frame of reference for judging the effectiveness of an intervention.

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Appendices

Table below describes the wage distribution of child care workers and elementary teachers in the US and within Louisiana.

Table A 1. Annual earnings of child care workers and elementary teachers in Louisiana compared to the U.S.

	Childcare Workers			Elementary Teachers		
Location	**Low (10%)**	**Median (50%)**	**High (90%)**	**Low (10%)**	**Median (50%)**	**High (90%)**
United States	$18,380	$25,460	$37,720	$40,030	$60,940	$100,480
Louisiana	$16,730	$19,450	$27,890	$40,950	$48,700	$62,200
Alexandria, LA	$16,510	$18,790	$26,320	$40,930	$46,640	$55,910
Baton Rouge, LA	$17,050	$21,140	$29,670	$41,100	$49,790	$63,090
Central Louisiana nonmetropolitan area	$16,820	$19,690	$29,340	$37,510	$46,280	$57,140
Hammond, LA	$16,720	$20,170	$29,790	$38,460	$47,130	$59,840
Houma-Thibodaux, LA	$16,680	$19,470	$25,550	n/a	n/a	n/a
Lafayette, LA	$16,710	$19,190	$27,830	$41,570	$47,710	$59,480
Lake Charles, LA	$16,470	$18,760	$24,340	$42,690	$48,700	$60,160
Monroe, LA	$16,560	$18,860	$23,490	$41,180	$48,470	$60,850
New Orleans-Metairie, LA	$16,840	$19,530	$28,790	$40,990	$49,860	$63,900
Northeast Louisiana nonmetropolitan area	$16,640	$18,990	$28,350	$34,210	$45,410	$57,520
Shreveport-Bossier City, LA	$16,510	$18,720	$26,480	$43,030	$51,930	$63,790
Southwest Louisiana nonmetropolitan area	$16,630	$18,660	$21,420	$39,050	$47,370	$58,890

Source: Bureau of Labor Statistics 2020 wage data, ONet

Tables referenced in the method section here include randomization of centers to treatment and control groups.

Table A 2. Number of centers by LDOE Regional Management Area (RMA)

RMA	Control Centers N	Treatment Centers N
Alexandria	8	24
Baton Rouge	60	100
Houma	5	17
Lafayette	32	47
Lake Charles	11	19
Monroe	15	38
New Orleans	58	115
Shreveport	29	51
Grand Total	218	411

Table A 3. Expected and observed proportion of treatment centers by LDOE Regional Management Area (RMA)

	Percentage of Treatment Centers	
RMA	Expected	Observed
Alexandria	5.1%	5.8%
Baton Rouge	25.4%	24.3%
Houma	3.5%	4.1%
Lafayette	12.6%	11.4%
Lake Charles	4.8%	4.6%
Monroe	8.4%	9.2%
New Orleans	27.5%	28.0%
Shreveport	12.7%	12.4%
Total	100.0%	100.0%

Table A 4. Counts of pilot centers located within each Louisiana parish

Parish	Pilot Centers N	Parish	Pilot Centers N
East Baton Rouge Parish	69	St. Mary Parish	4
Orleans Parish	56	West Baton Rouge Parish	4
Jefferson Parish	47	Avoyelles Parish	3
Lafayette Parish	37	Iberville Parish	3
Caddo Parish	33	Livingston Parish	3
Ouachita Parish	26	Madison Parish	3
Tangipahoa Parish	26	Plaquemines Parish	3
Rapides Parish	24	Acadia Parish	2
St. Tammany Parish	23	Bienville Parish	2
Calcasieu Parish	21	DeSoto Parish	2
St. Landry Parish	12	Evangeline Parish	2
Bossier Parish	12	Jefferson Davis Parish	2
Terrebonne Parish	11	St. Helena Parish	2
Ascension Parish	11	St. Martin Parish	2
Lincoln Parish	9	Union Parish	2
Washington Parish	9	Vernon Parish	2
Iberia Parish	8	West Feliciana Parish	2
Lafourche Parish	8	Allen Parish	1
St. Charles Parish	7	Assumption Parish	1
Natchitoches Parish	6	Caldwell Parish	1
Pointe Coupee Parish	6	Claiborne Parish	1
Franklin Parish	5	Concordia Parish	1
St. Bernard Parish	5	East Feliciana Parish	1
Vermilion Parish	5	Jackson Parish	1
Webster Parish	5	Richland Parish	1
Morehouse Parish	5	Sabine Parish	1
St. John the Baptist Parish	4	St. James Parish	1

The figure below shows the spread of Type III centers enrolled in the pilot program.

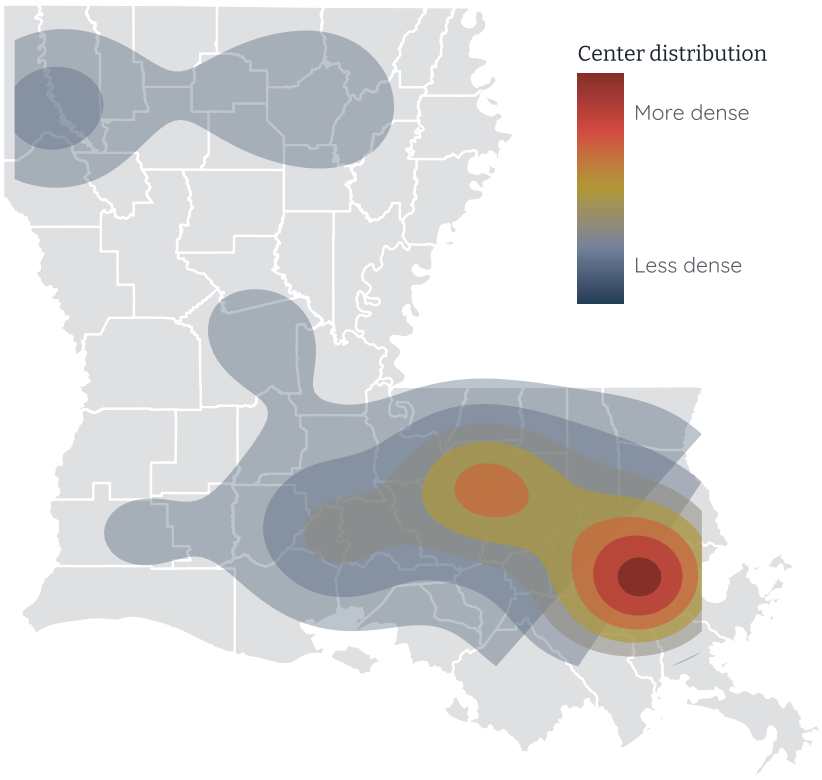

Figure A 1. Spatial map with location density of CCAP pilot centers
Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 544

The following tables are the outputs of diagnostic tests performed with the data prior to regression analyses. Below are measures of baseline equivalence between groups, associations measuring correlation, and variance inflation factors (VIF).

Table A 5. Metrics by award with significance tests between groups

Factor	Centers			Kruskal-Wallis test	
	Control (n = 173)	10% (n = 183)	2080 (n = 188)	χ^2	ξ^2
Teacher base pay	11.63	12.13	11.50	9.78*	.015
# of teachers per center	8.31	8.72	8.54	1.63	-.001
Poverty rate/zip code	20.45	21.68	21.01	1.41	-.001
Center performance score	5.51	5.47	5.43	2.56	.001
% teachers without degree	0.47	0.43	0.52	5.86	.007

Source: CCAP Pay Pilot survey data | August 2022 to August 2024 | N = 8,093
Note: *$p < .05$

Table A 6. Correlation test of associations among pairs of variables

Variable Pairs Analyzed		Pearson Correlation (r)
Center-level CLASS scores		
Performance score	Engaged support for learning	.84
Performance score	Emotional/behavioral support	.77
Performance score	Instructional support score	.74
Performance score	Emotional support score	.73
Center-level education		
No degree	Child development associate	-.81
No degree	Louisiana certification	-.72
Area characteristics		
Average income by zip code	Poverty rate	-.80

Source: LDOE Center Performance Profile data (2022); American Community Survey (ACS) 5-year estimates (2020)
Note: Correlations over .70 were considered high

Table A 6. Test of Variance Inflation Factors across selected variables

Predictor	VIF
Teacher base pay	1.08
# of teachers per center	1.14
Poverty rate by zip code	1.07
Center performance score	1.18
% teachers without degree	1.27

Source: CCAP Pay Pilot survey data; LDOE Center Performance Profile data (2022); American Community Survey (ACS) 5-year estimates (2020)

The following tables display the detailed estimates of the survival models of the baseline cohort

Table A 7. Survival analysis life table output for baseline cohort

Time	Observations at risk	Turnover events	Censored
0	4,612	0	0
1	4,076	536	0
2	3,717	359	0
3	3,419	284	14
4	2,996	423	0
5	2,788	208	0
6	2,654	130	4
7	2,512	134	8
8	0	0	2512