

Executive Summary

Evidence suggests that high quality early care and education (ECE) can benefit young children, particularly children in families with low incomes. This evidence has prompted increased state and federal investment in quality improvement initiatives and placed emphasis on helping families with low incomes gain access to high quality ECE. Policymakers, administrators, and program and center directors must weigh competing demands and limited resources for program improvement, but they lack information about the cost of high quality care and the best ways to use resources at the center level to meet expectations for quality.

A. Introduction

The Office of Planning, Research, and Evaluation (OPRE) in the Administration for Children and Families contracted with Mathematica to develop measures that can inform pathways to quality, through the Assessing the Implementation and Cost of High Quality Early Care and Education (ECE-ICHQ) project. The ICHQ (pronounced I-check) measures capture (1) **implementation** of activities that can support quality in center-based early care and education settings serving children from birth to age 5 (not yet in kindergarten) and (2) the **cost** of providing care in these settings. The ICHQ implementation and cost measures are framed around five key functions of center operations: (1) Structural Supports for Instruction and Caregiving; (2) Instructional Planning, Coordination, and Child Assessment; (3) Center Administration and Planning; (4) Workforce Development; and (5) Child and Family Support.

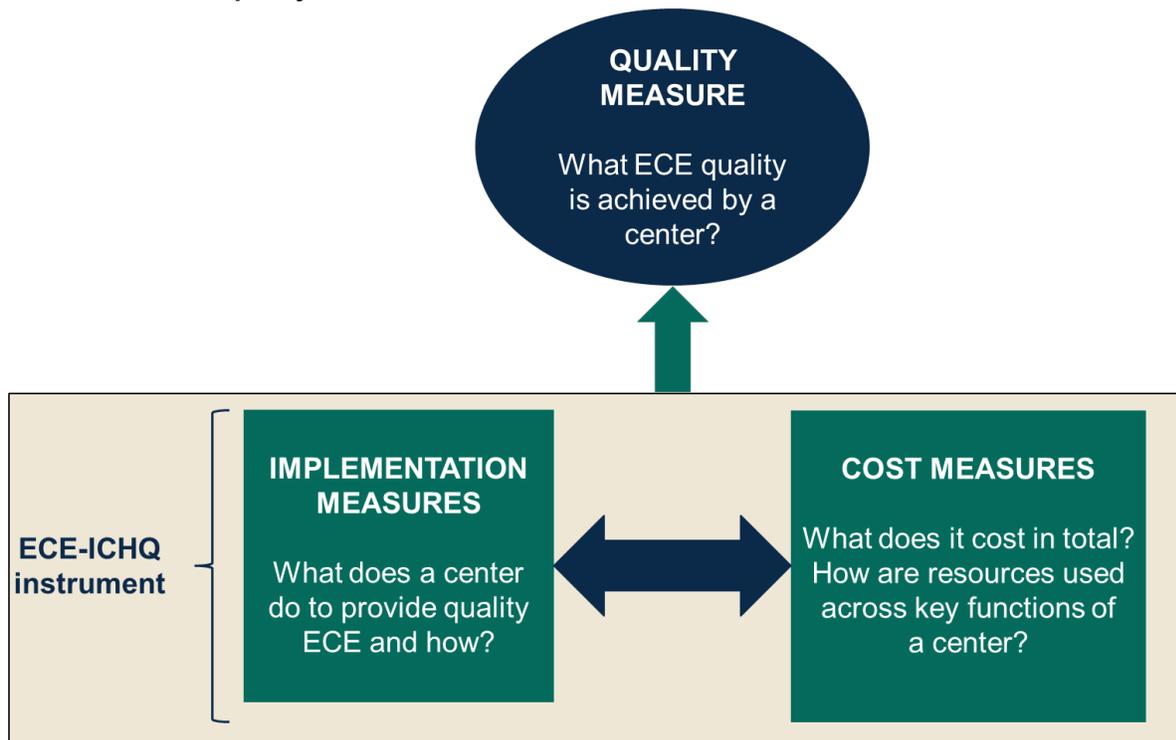
The measures can help us look at different pathways to quality and inform decisions about how centers can use resources effectively to deliver high quality ECE. The project has three components: (1) foundational work of a literature review and conceptual framework; (2) a phased multi-case study of centers to collect data for use in creating draft measures; and (3) a field test to validate the measures and finalize the instrument. This report focuses on the results from the multi-case study, describing the development of the draft measures of implementation and cost and how they perform.

The final **instrument** will include all the data collection tools, guidance for producing the measures from the collected data, and instructions for interpreting and using the measures.

B. Purpose and primary research questions

The goals of ICHQ are to (1) produce technically sound, systematic measures of the implementation and costs of education and care in center-based settings that serve children from birth to age 5; (2) produce implementation and cost measures to examine the variation in ECE center capacities and resources that can make a difference in quality and the experiences of children; and (3) develop a feasible and useful instrument to guide the collection, development, and reporting of the measures. The measures are intended for use in research to examine and explain variations in quality, in practice to inform quality improvement, and in policy to inform funding and technical assistance.

Exhibit ES.1. ECE quality and ECE-ICHQ measures



This report describes the approach to the multi-case study, details the development of the implementation and cost measures, and presents next steps for testing and using the measures. Five research questions guided the work of the multi-case study:

1. What implementation activities support each key function and can we reliably measure implementation of each function?
2. How do staff members use their time in support of key functions within the center?
3. What are the costs associated with the implementation of key functions?
4. Are differences in center characteristics related to implementation and costs?
5. Can implementation and cost measures be aligned to inform decisions to guide quality improvement?

C. Key findings and highlights

Early testing with a purposive sample of 30 centers suggests that the ICHQ measures are capturing important information about implementation and costs and the variation that exists across centers. The measures are doing what they are intended to, and they hold promise for working together to inform pathways to quality.

Useful and relevant measures for interpreting implementation—what a center does to support quality and how—need to comprise a small set of items that can be used consistently across a range of center-based ECE settings. Our aim was to create measures with good psychometric properties that would be ready for more formal testing as part of a field test.

- **The implementation scores for each of the five key center functions produced reliable scales.** The items for each function measure the same thing in different ways and together they capture the essence of the function (they hold together). The measures appear to be dependable for assessing implementation of each key function.
- **Implementation scores for each key function have distributions that can detect differences across centers.** The scores for each key function have substantial variation; we are able to tell centers apart in the middle of the distribution as well as along the tails.
- **Implementation scores for the key functions are related to each other, but each also provides distinct information.** We found moderate, significant associations among the implementation scores of the five key functions. The scores for Center Administration and Planning are positively and significantly correlated with the scores of the other four functions, suggesting the central nature of this function in driving implementation.

Psychometric properties show how reliable and valid a measure is based on the purposes for which it is designed and used.

Reliability. Indicators of reliability show how dependable a measure is for the purpose for which it is used. Reliable measures are stable over time and include items that measure the same thing in different ways.

Validity. The degree to which an assessment accurately measures what it is designed to measure. In the early stages of measures development, validity can be examined based on patterns with other observable variables or characteristics.

The measures demonstrate validity based on patterns with observable characteristics and what we know from previous cost studies.

- **On average, center staff reported spending their time in expected ways.** Directors reported spending more of their time on Center Administration and Planning than other staff. Lead teachers, head teachers, or co-teachers reported spending more of their time on Instructional Planning, Coordination, and Child Assessment relative to assistant teachers, who reported spending more of their time on Instruction and Caregiving.
- **The cost measures show that the costs of staff compensation and facilities made up nearly 80 percent of total costs, on average.** Centers invest in staff compensation (salary and fringe benefits) as the largest proportion of costs (62 percent, on average). Facilities, and supplies and materials account for the next largest proportions of costs (16 percent and 9 percent, respectively, on average). This allocation is in line with past cost studies in ECE.
- **Centers spent the largest portion of costs on the Instruction and Caregiving function.** Centers in the sample directed 33 percent of costs to the Instruction and Caregiving function, on average, and 22 percent of costs to the Instructional Planning, Coordination, and Child Assessment function. The centers spent just over one-quarter of their total costs (26 percent, on average) on the Center Administration and Planning function. Spending on the Workforce Development function accounted for 8 percent of total costs, on average, and spending on the Child and Family Support function accounted for 10 percent of total costs.

- **Implementation and cost measures vary with center characteristics in ways we would expect.** In our sample, centers with high QRIS ratings have higher implementation scores and costs per child care hour, on average, on each key function than centers with low QRIS ratings. We also saw in the sample, for example, that the average cost per child care hour was lower for centers that served school-age children in addition to children ages 0 to 5 than for centers that only served children ages 0 to 5. We could not conduct statistical tests for significance between the mean scores of centers with different characteristics, given the small number of centers within each characteristic subgroup.

The measures appear to work together in ways that can identify and inform relationships with quality.

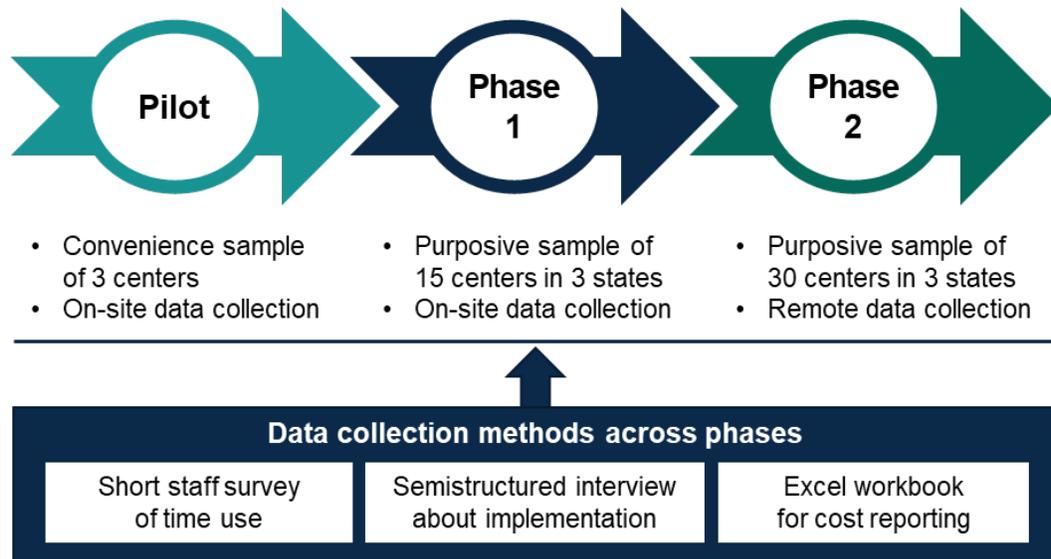
- **The implementation and cost measures are related.** We found positive associations between four of the five implementation scores and total cost per child care hour. The implementation scores and cost per child care hour for each key function are also positively related, meaning the higher the implementation score, the higher the cost of the function. These relationships are expected and important in validating the measures.
- **There is a good deal of variation in both implementation and costs at the center level.** There is more to the story beyond observing that implementation and higher costs are generally higher in centers with high QRIS levels. Scatterplots of the measures across the functions show that QRIS levels do not completely predict center implementation scores and costs. For example, we observe some low quality level centers with above median implementation function scores. It was rare, however, to observe above median costs in centers with low quality levels.

D. Methods

At the start of the project, the study team conducted a literature review to inform a conceptual framework, guide data collection in the multi-case study, and support the development of measures (see Caronongan et al. 2016).

A phased approach to data collection in the multi-case study provided opportunities to refine the measurement constructs and data collection tools and processes, and to develop draft measures. The multi-case study included (1) conducting semistructured interviews about the intentionality, structure, and consistency of *implementation* of key functions of a center that can support quality; (2) collecting *cost* data through Excel workbooks to assess center-level costs by key function and how resources are used across functions; and (3) administering surveys about *staff time use*—essential information for allocating costs to key functions, since labor is a large driver of costs in ECE centers (Exhibit ES.2).

Exhibit ES.2. Overview of the ECE-ICHQ multi-case study



The length of the data collection tools, the methods of collection, and the number of participating centers differed across the phases. The multi-case study began with an *exploratory* pilot study with three centers in the fall of 2015 to test the data collection approach and make an initial assessment about the relevance, appropriateness, and connection of the topics covered in each data collection tool. We then recruited 15 centers to participate in a comprehensive *formative* phase of data collection in the fall of 2016 to test the feasibility of data collection tools and methods, conduct cognitive interviewing to obtain feedback from the respondents about the topics and methods of collecting the information (such as relevance, clarity, and ease), and refine the tools. Based on what we found in Phase 1, we developed a set of measures to test in Phase 2. Phase 2 consisted of *early testing* of the new measures to ensure that they are technically sound (meaning they are reliable and the measures of implementation and cost are related) and can be used consistently across a range of ECE center-based settings.

We structured data collection in Phase 2 around the functions in the conceptual framework and the functions connected to the implementation and cost data collection (Exhibit ES.3).

Exhibit ES.3. Implementation and cost data collection to understand key functions of a center

E. Implications for next steps

The findings from the phased multi-case study provide preliminary evidence that the measures are capturing variations in implementation and costs among centers and are working together in ways that have the potential to inform pathways to quality. The measures are not yet fully validated, meaning they have not been tested in a large, representative sample of centers to look at associations with center quality or children’s outcomes.

We are pursuing a step in this direction through a field test with a purposive sample of 80 centers in 4 states. Using data collected in the field test, we will create the implementation scores and cost measures, assess their functionality and validity, and examine associations among implementation, cost, and quality. Specifically, we will: (1) examine whether the cost and implementation measures explain variation in quality beyond what is explained by center characteristics; (2) examine the degree to which each set of measures (cost and implementation) is related to quality, independent of the other; and (3) test whether the relationship between cost and quality varies by levels of implementation (that is, whether implementation moderates the relationship between cost and quality).

The ICHQ measures have the potential to support the efforts of researchers, practitioners, and policymakers to better understand pathways to achieving high quality. These insights can inform decisions about the level of resources needed and how to best use resources across functions at the center level to deliver high quality early care and education. Examples of potential uses of the measures include:

- Practitioners could use the measures to examine implementation and costs of quality within a single center to understand and guide quality improvement or needs for technical assistance.
- Federal and state administrators could use the measures to examine a group of centers within a state or across states to inform decisions about quality improvement initiatives or subsidy rates.
- Federal policymakers could use data collected with the ECE-ICHQ instrument to inform cost modeling for efforts to expand access to high quality early care and education.

- State leaders might use measures of the cost of high quality care to inform subsidy payments and policymaking that promotes cost-efficient paths to enhance program quality. If observations vary by geographic location or center characteristics, policymakers and administrators might target funding and quality improvement efforts appropriately.
- Researchers could use the measures to compare cost and implementation patterns among different ECE program models, explore pathways to quality, or make them part of a cost-benefit analysis.
- More generally, the ICHQ measures could contribute to equity considerations by measuring the services centers provide and the cost of services by the characteristics of the children and families served.

Glossary/key terms

This report and the ECE-ICHQ project focus on implementation, cost, and quality measures within center-based ECE settings. A **center** refers to a specific physical location where ECE classroom-based services are provided to children ages 0 to 5.

Implementation measures assess what a center does and how it does it. These elements include the package of services a center provides, including structural features and adopted practices.

Cost measures assess the resources that provide the package of services and resource use across functions.

High quality center-based ECE refers to centers that achieve positive child outcomes through positive teacher-child interactions and a positive learning environment.

Key functions are the tasks in which all center-based ECE providers engage. The key functions drive how a center operates to achieve quality. Each of the five key functions has a set of activities and practices that allow us to measure implementation and costs for each function distinctly.