

# The Cost and Quality of Full Day, Year-round Early Care and Education in Maine: Preschool Classrooms

A report on the findings from  
**The Maine Cost and Quality Study**  
Funded by the Maine Office of Child Care and Head Start

## Acknowledgements

The research team would like to recognize the work of the Maine Office of Child Care and Head Start and the Data Collection Advisory Board, listed below, in supporting the development of the Maine Cost/Quality Study; their comments on the study at various stages were invaluable and we look forward to future collaborative efforts. However, any errors in this report are solely the responsibility of the authors. Members of this Advisory Committee include state agencies, local Child Care Resource and Development Centers, CAP agencies, early childhood coordinators, local providers, higher education institutions, legislative aides and other interested individuals (see below). The authors also wish to thank the directors, teachers and other staff of the centers who participated in this study, and gave freely of their time and information.

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Recommended Citation: Nancy L. Marshall, Cindy L. Creps, Nancy R. Burstein, Joanne Roberts, Julie Dennehy, Wendy Wagner Robeson, Frederic B. Glantz. 2004. *The Cost and Quality of Full Day, Year-round Early Care and Education in Maine: Preschool Classrooms*. Wellesley Centers for Women, Muskie Institute of the University of Southern Maine, and Abt Associates Inc.

## Preface

The message emanating from brain research and research on early care and education programs is clear: quality early experiences have a positive impact on the development of a young child, and contribute to greater school readiness. Providing early educational, emotionally supportive and nurturing experiences are vital in order for children to develop successfully.

**There are an estimated 45,000 (based on capacity) children in early education and care programs in Maine.** The state's substantial investment of over \$37 million in early childhood education, plus an additional \$10 million from the TANF block grant, coupled with the large numbers of children in child care programs, makes understanding the quality of services imperative, both to children's welfare and for planning effective state investments.

In 2001, The Maine Office of Child Care and Head Start contracted with Wellesley College Center for Research on Women, Muskie Institute of the University of Southern Maine, and Abt Associates to conduct a study of the cost and quality of early care and education in Maine. We are pleased to present the first report from this study, addressing early care and education for preschool-aged children in full-day, year-round community child care centers. A future report will address early care and education in family child care homes throughout Maine.

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## Introduction

Over the last 30 years, there has been an enormous increase in the rate at which mothers with young children enter the labor force. In fact, 67% of children in Maine, ages 0-12, reside in households where all adult members work. Early care and education serves as a vital community resource enabling parents to work; early care and education also contributes to children's development (Smith 1998).

The Cost, Quality and Child Outcomes Study (Helburn 1995) provided dramatic evidence of the lack of quality early care and education in the four states studied, with 76% of the observed center-based programs rated "poor" or "mediocre" on the Early Childhood Environment Rating Scale. Infant/toddler rooms were of even lower quality, with about 90% rated less than "good". The Relative and Family Day Care Study (Galinsky et al. 1994) found that relative care was of lower quality than regulated family child care, with 69% of relative caregivers rated "inadequate", compared to only 13% of regulated family child care providers.

In a study of multiple forms of non-maternal care (including centers, family child care and relative care), the NICHD Study of Early Child Care found that 57% of the children in non-maternal care received poor or mediocre care (NICHD ECRN 2000). Children in center-based care with higher ratios of children to adults received the poorest quality care.

Given the national picture generated by the cumulative evidence from these and other studies, serious questions are raised about the quality of early care and education in Maine. While Maine has many exemplary programs, what is the range of quality in the state? What is the quality of center-based early care and education?

### The Quality of Care

A key element of any response to these questions is the measurement of the quality of care that children are receiving. Two main aspects of quality have been the focus of many studies of early care and education quality: structure and process. Structural characteristics such as group size, staff-child ratios, and caregiver education have been associated with children's development—the ultimate indicator of quality care. These characteristics, however, only explain a portion of the variance in children's development. A more thorough understanding of the quality of care that children experience requires an examination of what actually happens in the care setting—How do caregivers and children interact? What materials are available for the children and how do adults support children's use of those materials? These process characteristics of care tell us a great deal about the quality of care that children experience. By examining both structural and process characteristics, we can describe more fully the care that children receive. Then, by examining the relationships between the two aspects of quality, we can begin to address ways to improve quality.

## **The Cost of Quality Care**

Another central component of the early care and education puzzle is the cost of care—for families and for providers. For children in center-based care, the relationship between family income and quality is not linear. Rather, children in either lower-income families or higher-income families are more likely to receive higher quality care than children in moderate-income families (Phillips et. al. 1994). Low-income families, however, are less likely to use center-based care, at least in part because the cost of this form of care can be prohibitive. The questions remain: Do families with low or moderate incomes have access to quality early care and education in Maine? If we want to raise the overall level of quality of care in Maine and make high quality care available to families from all income levels, what might it cost?

In order to answer the second question, we must first understand what the cost of providing early care and education is in Maine. One of the challenges we are presented with is the proper measurement of the full cost of early care and education. As noted in the Cost, Quality, and Child Outcomes Study (Helburn, 1995), full costs include both costs incurred by a center and reported on its statement of income and expense, as well as the value of in-kind contributions (e.g. volunteer labor and donated or subsidized space). To truly understand what it costs to provide early care and education, it is essential to gather information in both areas. Then, by gathering information on the cost of care, we are able to explore the relationship between cost and quality and understand how much more quality care costs.

## Research Questions and Study Design

The Maine Cost and Quality Study was designed to address four broad research questions:

- What is the quality of center-based preschool early care and education in Maine?
- What are the costs of these early care and education programs?
- What is the relationship between quality and costs? Does it cost more to provide higher quality care?
- What is the relationship between the family income of children served and the quality of care provided by full-day, year-round, center-based preschool programs?

This report presents the findings from the **first phase** of the Maine Cost and Quality Study, which examined the research questions in **full-day, year-round centers serving preschool-aged children** (31 months up to 6 years). This study was designed to provide an accurate, up-to-date picture of the cost and quality of early care and education services for preschoolers. This study was **not** designed to evaluate the effectiveness of specific regulations, subsidies or other policies. Answers to these and other questions would require a different study design than that used to provide this snapshot of early care and education for preschoolers in Maine.

**Study Design.** We drew a random sample of **90 community-based centers serving** preschoolers on a full-day, full-year basis. The centers were randomly selected from Maine's 16 counties. Head Start programs were not included in the sample because other on-going studies were addressing the specific needs of this program model.

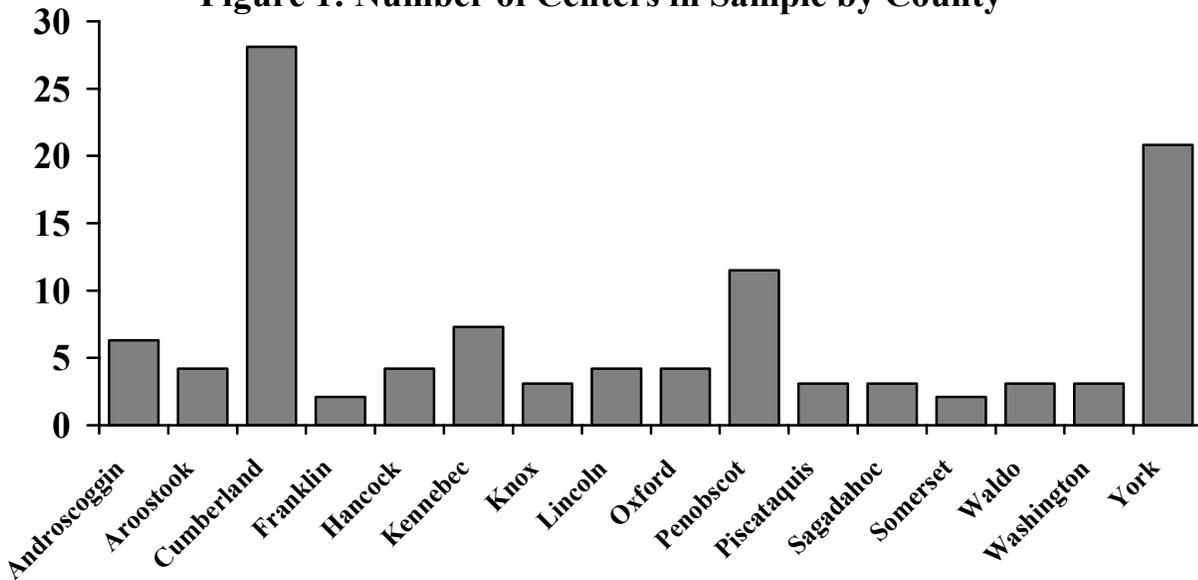
Centers were drawn from across the state, in direct proportion to each county's market share of the state's center-based, early care and education market. Due to the rural nature of some the counties, a 3 center minimum per county was established. Figure 1 shows the percent of centers in the sample from each of Maine's 16 counties.

Seventy-nine percent of the selected eligible centers agreed to participate in the study. This is higher than the response rates from the original Cost, Quality and Child Outcomes Study, which ranged from 41% in North Carolina and 44% in California, to 68% in Colorado and Connecticut.

Each center's likelihood of being selected into the sample was proportional to their share of the market. That is, their likelihood reflected the number of children they served, relative to the number of children served by other centers in their county. In our descriptive analyses, the data from each center were weighted to reflect their market share. In addition, all data have been weighted to adjust for sampling probability, ineligibility for the study, and non-response, to produce descriptive statistics representative of the entire state. This report includes data from centers from all counties of the state, from not-for-profit and for-profit centers, and serving a variety of children and their families.

To measure the quality of care, a single preschool-aged classroom was randomly selected in each of the centers in our sample. Specially-trained data collectors observed classrooms for three to four hours, working with center staff to select a time that was convenient for the programs and that was typical of the usual care environment for that classroom (i.e., not on a day when a field trip was planned, nor when half the class or the regular teacher was sick). At the conclusion of the observation, data collectors interviewed teachers to gather information on their education and training. Center directors or owners were interviewed separately about general center characteristics, enrollment, staffing, revenues and expenditures.

**Figure 1: Number of Centers in Sample by County**



# The Quality of Early Care and Education in Preschool Classrooms

## What is Quality Early Care and Education?

Quality of early care and education has been defined differently across numerous studies of the quality of care. Many studies have relied on structural characteristics as the sole measure of quality. Structural characteristics include classroom characteristics, such as the child:staff ratio (number of children per qualified classroom staff) and group size (number of children in the classroom). It also includes features of providers and directors including education and specialized training. The features of structural quality are regulatable, and most states set minimum standards for at least some aspects of structural quality. These structural characteristics have been shown to be associated with children's development (c.f., Howes 1997; NICHD Early Child Care Research Network 1999; Burchinal, Roberts, Riggins et al 2000), the ultimate indicator of quality care. These characteristics are only one piece of the overall quality, however, and help to set the stage for the process characteristics.

A more thorough understanding of the components of quality requires an examination of what actually happens in the early care setting (that is, the process). How do adults and children interact? What materials are available for the children and how do adults support children's use of those materials? It is these aspects of the early care and education environment that scales like the Early Childhood Environment Rating Scale-Revised Edition (ECERS-R; Harms, Clifford, & Cryer 1998) have been designed to measure. These process measures tell us much more about the quality of care children receive. The process characteristics refer to the nature of the care that children experience and are often harder to measure than the structural characteristics. They include the warmth, sensitivity, and responsiveness of the caregivers, the emotional tone of the setting, the activities available to children, the developmental appropriateness of activities, and the learning opportunities available to children. These process measures of quality have been shown to be associated with children's cognitive and socio-emotional development (c.f., Helburn et al 1996). Unlike the features of structural quality, process characteristics are not generally subject to state or local regulations.

To fully understand the quality of care children are receiving, it is necessary to understand both aspects of quality. Then, we can examine the relationship between structural and process characteristics of quality to begin to address ways to improve the quality of early care and education.

## Structural Characteristics of Quality

Through our observations we were able to gather information on both the structural and the process characteristics of quality. Information on provider *education* and *specialized training* in early care and education was gathered through interviews with providers and directors. During the course of their observations, data collectors recorded the numbers of children and staff present at different times. From this, we calculated average *group size* and average *child:staff ratio* for each classroom. From center directors or owners, we gathered information on the structure of the center, the education and training levels of all teaching staff (not just those in the observed classroom), and issues surrounding *staff turnover* and hiring.

## Process Characteristics of Quality

To provide a comprehensive understanding of the process characteristics of quality, multiple measures were used during the observation. We selected measures that have been widely used in early child care and education research as well as those used in the original Cost, Quality, and Child Outcomes Study. It was also important to select measures that would allow us to compare the data from this study with data from other studies, to place the quality of Maine' early care and education in a broader context.

## The ECERS-R – Benchmarks for Early Care and Education

The primary measure of quality used in this study was the Early Childhood Environment Rating Scale - Revised Edition (ECERS-R; Harms, Clifford, & Cryer 1998). The ECERS-R is a recent revision of the ECERS, which was the first in a series of rating scales developed by Drs. Harms, Clifford and Cryer for use both by practitioners and by researchers. The ECERS has been widely used for a number of years, and has become one of the standards in the field, offering useful benchmarks for practitioners, researchers and policymakers. The ECERS has good predictive validity, with studies showing that ECERS scores are related to children's development (c.f., Peisner-Feinberg & Burchinal 1997; Whitebook, Howes, & Phillips 1990). The ECERS was used in the original Cost, Quality and Outcomes Study (Helburn 1995), on which this Maine study is modeled. By using the ECERS, the picture we develop of early care and education in Maine is directly comparable to that in other states.

The ECERS-R is a 43-item scale designed to be used in center-based care for children aged two to six years. The ECERS-R is organized into seven scales: Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interaction, Program Structure, and Parents and Staff. Each scale has additional subscales, with multiple items that must be passed to receive a given score. Each subscale is scored on a seven-point scale, with benchmarks established for 1 = "Inadequate", 3 = "Minimal", 5 =

“Good”, and 7 = “Excellent”. Programs that pass some of the items that are part of the benchmark for a “3”, but not all of them, are scored a “2” on that subscale. Similarly, programs that fall between “Minimal” and “Good” are scored a “4”, and programs that fall between “Good” and “Excellent” are scored a “6”.

The ECERS-R ratings were based on observations by trained observers. As a measure of the inter-rater reliability of the observations, we calculated the proportion of the items on which a pair of observers, observing the same classroom, agreed exactly on the ratings. On average, agreed exactly on 83% of the ECERS-R items; on average, a pair of observers agreed within one point on the 7-point scale on 94% of the ECERS-R items.

In the following sections, we provide an overview of the meaning of these benchmarks in the seven ECERS-R scales.

**Space and Furnishings.** The setting is the context in which early care and education takes place. **Inadequate** space is crowded, poorly lit and poorly ventilated, in poor repair. Settings are described as having inadequate furnishings when there is not enough basic furniture and equipment (e.g., enough chairs for all the children; soft toys and gross motor equipment, such as climbing equipment or balls, are not available) or furniture is in poor repair, and when the space is arranged in such a way as to make it difficult for children to play – materials aren’t grouped in ways that encourage children to use them, walls between areas make it difficult for staff to supervise children at play, or children do not have access to play areas apart from the main flow of the classroom.

Classrooms that provide this bare minimum – enough space and basic furniture for children and adults, adequate light and ventilation, space and furnishings in good repair and safe, some age-appropriate play equipment available – are rated as meeting **Minimal** standards. To be rated as **Good** on Space and Furnishings, a classroom must provide ample indoor and outdoor space with room for the children to move around freely; the space and furnishings must be arranged in a way that facilitates play and minimizes disruptions (for example, in well-defined activity centers – art area, blocks; trike-riding is separated from the ball-play area; quiet areas and active areas do not interfere with each other); and children’s artwork or photos of recent activities must be displayed, with many items at children’s eye level, among other standards.

Classrooms are rated as **Excellent** on Space and Furnishings only if they meet all of the above standards, plus additional, higher standards, including: light and ventilation that can be controlled (windows that open; blinds that close); special furnishings such as a woodwork bench, sand/water table or art easels; accessible areas with cushions or other cozy play areas; at least five different activity areas to provide a variety of learning experiences; activity areas that are organized so that materials are nearby and children can access the materials themselves (e.g., open shelves, labeled containers); some quiet activities, for

one or two children at a time, are available; projects which reflect individual children's creativity (not simply copies of adult examples) are displayed; outdoor space has some protection from the elements, convenient features such as close to drinking water, accessible storage of equipment.

<b>Personal Care Routines Benchmarks</b>	<p><b>Personal Care Routines.</b> A classroom is rated as <b>Inadequate</b> in Personal Care Routines if: children are often not greeted on arrival; children's departure is disorganized or parents are not allowed to bring their children into the classroom; meals and snacks do not meet USDA nutritional guidelines, children's food allergies are not accommodated, staff force children to eat, or there is a chaotic atmosphere at meal times; nap/rest times are too early or too late, or children are required to nap for more than 2 ½ hours, nap/rest times are not supervised or are supervised too harshly; toileting/diapering area is not sanitary, handwashing is often neglected after toileting; staff do not act to reduce the spread of germs (noses not wiped, diapers not disposed of properly, food preparation and toileting/diapering done near one another); smoking is allowed in child care areas; inadequate supervision to protect children's safety, several indoor or outdoor hazards that could result in serious injuries.</p> <p>A classroom that meets <b>Minimal</b> standards is one in which: most children are greeted warmly on arrival and their departure is well-organized; well-balanced meals and snacks are provided in an atmosphere that is non-punitive and meets children's needs; nap times are scheduled appropriately for most children with sufficient, non-punitive supervision; the toileting schedule meets the individual needs of children, with age-appropriate supervision; and staff take action to minimize the spread of infectious diseases. To be rated as <b>Good</b>, classrooms must: greet each child individually by name; have pleasant departure routines; welcome parents in the classroom and greet them warmly; most staff sit with the children at mealtimes; there is a pleasant social atmosphere at mealtimes and children are encouraged to eat independently with child-appropriate eating utensils; individual children's dietary restrictions are followed; at nap/rest time, staff help children to relax with soft music, cuddly toys or back rubs, the nap space is dimly lit, quiet and arranged to help children rest (cots or mats are placed for privacy, or separated by a solid barrier); when toileting/diapering, sanitary conditions are easy to maintain and there are pleasant interactions between staff and children; staff model good health practices; children are dressed properly for conditions (dry clothes, warm clothes on cold days, aprons for messy play); staff explain reasons for safety rules to children; staff anticipate safety problems and take action to prevent problems (e.g., remove toys under climbing equipment, lock dangerous areas, wipe up spills to prevent falls).</p> <p>Classrooms are rated as <b>Excellent</b> on Personal Care Routines only if they meet these standards, plus other, higher standards, including: on arrival, children are helped to become involved in activities, if needed; staff use greeting and departure times as information-sharing time with parents; children help during meal times (e.g. set the table, wipe up spills), children use child-size serving</p>
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utensils, such as small pitchers, mealtimes are used for conversations, staff encourage children to talk about things of interest to children; nap/rest schedule is flexible to meet individual needs, provisions made for early-risers or non-nappers; child-sized toilets and low sinks available, self-help skills while toileting promoted as children are ready; children taught own health practices (proper handwashing, putting on own coat or art apron); play areas arranged to avoid safety problems, children generally follow safety rules (e.g., no crowding on slides, no climbing on bookcases).

Personal Care

**Language-Reasoning.** A classroom is rated as **Inadequate** in the Language-Reasoning area when there are very few books out for children to use and staff rarely read to children; staff do not use activities that encourage children to communicate (talking about drawings, dictating stories, sharing ideas at circle time, finger plays, singing songs), there are very few materials accessible that encourage children to communicate (play telephones, puppets, dolls and dramatic play props, small figures and animals); staff do not talk with children about logical relationships (staff ignore children’s questions about why, do not call attention to sequence of daily events – what happens first, next – or to differences and similarity in number, size, shape; cause and effect); staff introduce concepts that are too difficult or with teaching methods that don’t include concrete experiences, staff give answers without helping children to figure things out; staff talk to children primarily to control their behavior and manage routines, staff rarely respond to children’s talk, children’s talk is discouraged much of the day.

Language-Reasoning Benchmarks

Classrooms that provide the bare minimum – some books accessible, at least one staff-initiated language activity daily (e.g., story-time), staff sometimes encourage children to communicate and talk about logical relationships and concepts, some concepts are introduced appropriate to the ages and abilities of the children, some staff-child conversation (e.g., short answer questions), children allowed to talk much of the day - are rated as **Minimal**.

To be rated as **Good**, classrooms must: have a wide selection of books accessible for a substantial portion of the day, organized in a reading area, use some additional age-appropriate language materials daily, staff read books to children informally (e.g., during free play); communication activities take place during free play and group times, materials that encourage children to communicate are accessible in a variety of interest centers (e.g. in the block area, the book area, the dramatic play area); staff talk about logical relationships while children play with materials that stimulate reasoning (e.g., size and shape toys, sorting games), children are encouraged to talk through or explain their reasoning when solving problems; there are many staff-child conversations throughout the day, language is primarily used to exchange information with children and for social interaction, staff add information to expand on ideas presented by children, staff encourages communication among children.

Language-Reasoning

To be rated as **Excellent** on Language-Reasoning, a classroom must meet all the above standards, plus other stricter standards, including: books and language materials are rotated to maintain interest, some books related to current classroom activities or themes; staff leave time for children to respond in conversations, balance listening and talking appropriately for age and abilities of children, link children’s spoken communication with written language (e.g., write down what children dictate and read it back to them); staff encourage children to reason throughout the day, using actual events and experiences, concepts are introduced in response to children’s interests or needs to solve problems; staff have individual conversations with most of the children, children are asked questions to encourage them to give longer and more complex answers (e.g., younger children are asked “what” and “where” questions, older children are asked “why” and “how” questions).

What Is the Difference Between “Good” and “Excellent”?

Sample Items on Discipline (from the Interactions Scale)

To Receive a Score of “5: Good,” a Classroom Must Pass:

- 5.1 Staff use non-punitive discipline methods effectively (Ex. Giving attention for positive behaviors; redirecting children from unacceptable to acceptable activity).
- 5.2 Program is set up to avoid conflict and promote age-appropriate interaction (Ex. Duplicate toys accessible, child with favorite toy given protected place to play).
- 5.3 Staff react consistently to children’s behavior (Ex. Different staff apply same rules and use same methods; basic rules followed with all children).

To Receive a Score of “7: Excellent,” a Classroom Must Pass:

- 7.1 Staff actively involve children in solving their conflicts and problems (Ex. Help children talk out problems and think of solutions; sensitize children to feelings of others).
- 7.2 Staff use activities to help children understand social skills (Ex. Use storybooks and group discussions with children to work through common conflicts).

Activities Benchmarks

**Activities.** A classroom is rated as **Inadequate** on the Activities scale if there are very few developmentally-appropriate materials available; if the activities available for children do not include music/movement, sand/water play, or nature/science activities, and rarely include art activities, and if TV/videos or computer games are not developmentally appropriate, or children have no alternatives to watching TV when it is on. In addition, a classroom is rated as **Inadequate** if, instead of including activities that promote acceptance of diversity, staff demonstrate prejudice towards others, and materials present only stereotypes.

A classroom is rated as meeting **Minimal** standards if some of each of the following types of **materials** are available: **small building toys**, such as Lincoln logs or Legos™, **art materials**, such as crayons and scissors, **manipulatives**,

such as beads for stringing, and **puzzles**, as well as some simple musical instruments, sand toys, blocks, dramatic play materials, nature/science materials, math/number materials, and materials showing diversity in a positive way. In addition, to meet **Minimal** standards, a classroom must also include the following **activities**: art activities with some individual expression allowed (not just teacher-directed products); staff initiate at least one music activity daily, and some movement/dance at least weekly; children encouraged to bring in natural things to share or add to collections (e.g., fall leaves from playground); TV/video is limited to one hour daily in full-day programs, computer turns are limited to 20-minutes daily; staff intervene appropriately to counteract prejudice shown by children or other adults (for example, by discussing similarities and differences, establishing rules for fair treatment of others).

To receive a **Good** rating, a classroom must provide more of the above materials, and a greater variety of each type of material, and the materials must be organized in such a way as to facilitate children’s creative use of the materials. In addition, a classroom with a **Good** rating uses everyday events as the basis of learning, for example, talking about the weather, discussing the change of the seasons, counting while climbing the steps.

To receive an **Excellent** rating on Activities, a classroom must meet all the above standards, plus: rotate materials regularly to maintain interest; store materials on open, labeled shelves so that children can take initiative in play; provide more elaborate or extended activities (for example, 3-D sculpture, projects that last several days; block play outdoors, bubbles in the water table, rice instead of sand, counting and recording the number of birds at the bird feeder); integrate activities across domains (for example, children making music instruments; paints available in fall colors when learning about seasons; dramatic play props linked to field trips or guests; books, computers and videos used to add information and extend children’s hands-on experiences); include diversity as part of daily routines and activities (for example, foods from different cultures as regular part of meals, music from different cultures, parents encouraged to share family customs with children).

**Interactions.** A classroom is rated as **Inadequate** on the Interaction scale if: supervision of children is inadequate to keep children safe; most supervision is punitive (for example, yelling, belittling children); children are disciplined severely (spanking, withholding food) or discipline is so lax that there is little order; expectations for behavior are largely inappropriate for the children’s age and developmental level; staff ignore the children, staff-child interactions are unpleasant; interactions among children are not encouraged, little or no staff guidance in how to get along with other children, few positive interactions among children - teasing, bickering, and fighting are common.

Activities Benchmarks

Interactions

Interactions Benchmarks

A classroom that meets **Minimal** standards for Interactions is one in which supervision is adequate to protect children’s health and safety; there are some positive interactions between staff and children and staff usually respond to children in a warm, supportive manner; most supervision and discipline is not harsh and expectations for children’s behavior are largely appropriate for the age and developmental level of the children; children are encouraged to interact positively, and staff interrupt negative or hurtful behaviors (name-calling, fighting).

A classroom that receives a **Good** rating is one in which: classroom staff act preventively, to remove unsafe equipment or defuse potentially dangerous situations; most staff-child interactions are positive; supervision is adjusted appropriately for age and abilities (e.g., younger or more impulsive children are supervised more closely); staff give children help and encouragement when needed; staff are aware of the whole group, even when working with one child or a small group; staff use non-punitive discipline measures effectively (giving attention for positive behaviors, redirecting children from unacceptable to acceptable activities); the classroom environment is set up to reduce conflict among children (enough toys, travel paths do not lead through activity areas); staff react consistently to children’s behavior (basic rules followed with all children); staff show warmth and respect for children, respond sympathetically to an upset child; staff model good social skills and help children develop appropriate social behavior (help children talk through conflicts instead of fighting, help children understand the feelings of others).

Program Structure Benchmarks

To receive an **Excellent** rating, classrooms must meet all of the above standards, plus: staff engage the children to elaborate their play (talking about what they’re doing, helping to set up play areas); staff maintain a balance between the child’s need to explore independently and staff input into learning; when problems arise, staff involve the children in solving their conflicts (e.g., help children think of solutions), use activities such as storybooks to help children understand social skills, and seek advice from other professionals about behavior problems; staff seem to enjoy the children and encourage the development of mutual respect between children and adults (for example, staff wait until children finish asking questions before answering, encourage children in a polite way to listen when adults speak); children usually get along with each other, and staff encourage the development of these skills through group activities (e.g., painting a mural together, making soup with many ingredients).

**Program Structure.** A classroom is rated as **Inadequate** on the Program Structure scale if: the schedule is either too rigid, with little time for individual interests or free play, or too chaotic, with little predictable sequencing of daily events or much of the day spent in unsupervised free play; children are kept in a group all day, with all children doing the same activity at the same time throughout the day; staff are not aware of children’s special needs and no attempt is made to meet children’s special needs or to involve children with disabilities with the rest of the group. A classroom that meets **Minimal**

standards in this area has a basic schedule that is familiar to the children; includes some outdoor and some indoor time each day, weather permitting, as well as some quiet play and some active play each day; some activities are done in small groups or individually; staff have information about children's special needs and make minor modifications to include such children; some effort is made to involve parents in setting goals and to involve children with disabilities in the ongoing activities of other children.

A classroom that meets **Good** standards is one in which the daily schedule provides a balance of structure and flexibility, with a variety of activities each day, including some that are child initiated; children do not spend long periods of time waiting between daily events; free play occurs for a substantial portion of the day, with appropriate staff involvement to facilitate children's play; whole group gatherings are limited to short periods, suited to the age and needs of the children, with many activities done in small groups or individually; staff make modifications to the program so that children with special needs can participate, follow through on the recommendations of other professionals, and keep parents involved in sharing information and setting goals.

To receive an **Excellent** rating, a classroom must meet the above standards, plus: staff act to make transitions in the schedule smooth (have materials for next activity ready before current activity ends; help a few children at a time wash up for lunch, rather than the whole group at once); the schedule is flexible to respond to individual children's needs (e.g., a shorter story time for a child with a short attention span); staff use their involvement in free play as an educational interaction (e.g., help children think through solutions to problems in play); different groupings of children used throughout the day, and staff engage in educational interaction with small groups and individual children as well as with large groups; children with special needs are integrated into the larger group in most activities.

**Parents and Staff.** A classroom is rated as **Inadequate** on the Parents and Staff scale if: no written information about the program is given to parents and parents are discouraged from observing or being involved in their child's program; there are no separate areas for staff and no staff breaks; staff do not have access to a phone, storage space for materials, or separate space for individual conferences when children are in attendance; staff do not communicate with each other about children's needs, or spend time socializing with each other instead of looking after the children, or do not share duties fairly with other staff; there is no supervision or feedback provided to staff; and no in-service training or staff meetings.

To meet **Minimal** standards, programs must: provide written information about the program to parents, share child-related information between parents and staff, allow some involvement of parents and family in program, and interactions between family members and staff are generally respectful and positive; make provisions for the personal needs of staff (e.g., separate adult

Program Structure Benchmarks

Parents and Staff Benchmarks

restrooms, at least one staff break per day) and for the professional needs of staff (access to a phone, storage space, individual conference space); provide a means for staff to share basic information about children's needs (e.g., food allergies); some staff supervision is provided, provide orientation for new staff and some in-service training, and hold some staff meetings to handle administrative concerns. In addition, staff interactions must not interfere with caregiving responsibilities and staff duties must be shared fairly.

A program that receives a **Good** rating on Parents and Staff is one in which parents are encouraged to observe before enrolling their child, and are provided with information about the philosophy and approaches of the program; there is much sharing of child-related information between parents and staff, and parent involvement is encouraged in a variety of ways; there is a separate staff lounge (may have dual use as administrative space); three staff breaks are allowed in an 8-hour day; there is on-site, separate administrative office space and satisfactory space for conferences; staff communicate effectively and supportively with each other; an annual supervisory observation and written evaluation is conducted, noting strengths as well as areas for improvement; regular in-service training is provided; monthly staff meetings are held that include staff development activities; some professional resource materials are available on-site.

To receive an **Excellent** rating, a program must: ask parents for an evaluation of the program annually, involve parents in decision-making roles in the program along with staff; provide a separate staff lounge and some flexibility in scheduling staff breaks; have well-equipped office space for program administration and separate conference and group meeting space; provide planning time for staff working in the same classroom at least every other week; provide clear guidelines for individual staff responsibilities and promote positive interactions among staff members; involve staff in self-evaluation and offer frequent observations and feedback on staff performance, in a helpful and supportive way; provide support for staff professional development and require staff with less than an A.A. degree in early childhood education to continue formal education.

### Other Measures of Quality

While the ECERS-R provides an excellent set of benchmarks for many aspects of quality, we also used additional measures that provide more specific information about caregiver behavior. These additional measures included:

- the Global Caregiving Rating Scale (Arnett, 1989), a 26-item scale that measures caregiver involvement and teaching style with children;

- the Teacher Involvement Scale (Howes & Stewart, 1987), a time-sample measure of the specific kinds of interaction that occur between a provider and a child, from ignoring to simple contact to intense contact; and

As a measure of the inter-rater reliability of these observations, we calculated the proportion of the items on which a pair of observers, observing the same classroom, agreed exactly on the ratings. On average, a pair of observers agreed exactly on 77% of the Global Caregiving Rating Scale items and 86% of the Teacher Involvement Scale items. The percent agreement within one point was 98% and 93% respectively.

### Composites Created for This Study

Most of the results presented in this report use the ECERS-R and its component scales, or the other individual measures described above. However, we collapsed these measures into two composites for our analyses examining the links between structural measures of quality and process measure of quality, to simplify the results. Two composite variables were created: Warmth and Sensitivity, and Stimulation. Each of these composites was created from relevant subscales or items from the measures described above, based on exploratory principle component analyses.

The *Warmth and Sensitivity* composite describes how providers interact with the children in the classroom, how warm they are to the children, the amount and types of interactions that occur, and how sensitive they are to children's needs. High scores signify a classroom where providers interact often and appropriately with the children, show warmth to the children, and respond to children's needs.

The *Stimulation* composite is a measure of the amount and variety of activities available to the children, the developmental appropriateness of the classroom structure, the amount and appropriateness of the language in the classroom, and how actively providers introduce stimulation into the environment. Higher scores signify more stimulating classrooms.

# The Quality of Early Care and Education in Maine's Preschool Classrooms

## Structural Characteristics of Quality

The most commonly reported measures of the structural characteristics of quality are child:staff ratio, group size and teacher education and training. All of these characteristics can be and are regulated by the state. There are age-related guidelines for maximum group size and child:staff ratio as well as minimum educational requirements for early childhood teachers. The Maine child care licensing regulations require that for full day care for preschool-aged children, group sizes must be no greater than 24 children, and the minimum allowable ratio is one teacher for every 10 children.

**Child: Staff Ratios.** The average observed child:staff ratio over the course of the observation time for the classrooms in our sample was almost 6 children (mean=5.68) to every staff member. The average observed child:staff ratio is well below the state licensing regulations that allow no more than ten preschool-aged children to every staff member in full-day centers. However, observed child:staff ratios tend to be lower than the maximum capacity ratios used for licensing, because of variations in children's attendance from day to day, throughout any given day, and even minute-to-minute during an observation. In addition, observations were conducted over the course of a morning, continuing through lunch time. This is typically the busiest time of day in child care centers and is the time when there is likely to be the largest number of staff present. Had the observations been conducted very early in the morning or late in the afternoons, it is possible that there would have been a larger average observed ratio. Finally, other studies often report observed ratios that are lower than state minimums, for the reasons noted above (see for example the Cost, Quality, and Child Outcomes Study, 1995, described in the next section of this report).

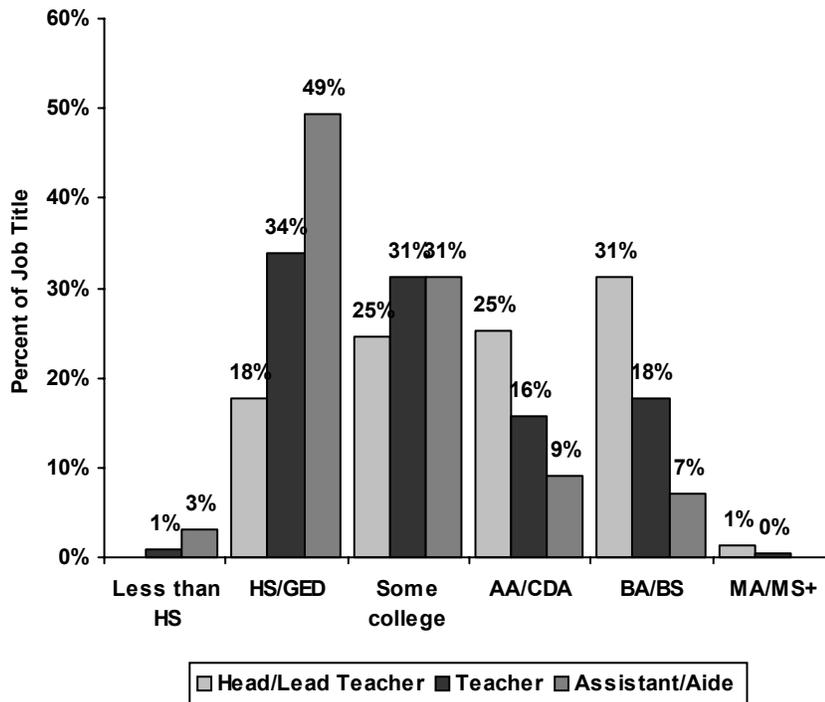
**Group Size.** When average group size was examined, once again we found that the classrooms in our sample had smaller group sizes than required by state regulations. While state regulations require a maximum group size of 24 for preschool-aged children in full time care, the average group size in the current study was about 10 children. Again, observed group size is different from licensed capacity, because of children's absences for illness, children's temporary absence from the classroom for toileting or activities outside of the classroom, and under-enrollment.

**Staff Education.** In addition to child:staff ratios and group size, we also examined classroom staff education and training levels. During the interview, center directors categorized all center staff based on their responsibilities. We provided specific definitions for each classification, however, we did not specify that directors classify staff according to state regulations. Rather, we asked them to classify staff according to what their job responsibilities entailed. Thus, a staff person identified as an assistant teacher here may not meet the exact requirements as outlined by the Office of Child Care and Head Start.

More than a quarter, 27%, of the staff in our sample were classified as Teachers. Teacher refers to individuals who may take responsibility of the classroom at times of the day but who also collaborate with other teachers. Seventeen percent of staff in our sample were classified as Head/Lead Teachers; these were staff who had primary responsibility for the children in their classroom, often with staff supervisory responsibilities. Assistant Teachers comprised 23% of the sample and were defined as individuals who worked under the supervision of another teacher. These individuals do not have sole responsibility for the classroom or supervisory duties. Directors/ Curriculum directors, 7% of the sample, were individuals who had staff supervisory and/or administrative responsibilities on a regular basis. Aides comprised almost 3% of the sample. Aides were defined as those individuals who work under the teacher but who are not included in licensing requirements for teacher/child ratios. The remaining percentage, 9%, of center staff were either paid work study students, administrative personnel or other professionals.

Approximately 18% of Head/Lead Teachers had a high school diploma/GED as the highest level of education completed. Licensing requirements for Head/Lead Teachers in Maine vary by size of the center (see Figure 2); for example, in centers licensed for only 13-20 children, a Head/Lead Teacher must have at least 30 hours of college credit. Based on our classification of individuals by job responsibilities, it appears that at least 18% of individuals functioning as Head/Lead Teachers in the sample do not meet minimal state standards for education. About one-fourth of Head/Lead Teachers had some college coursework and another one-fourth had completed an Associate's Degree or CDA. Thirty-three percent of Head/Lead Teachers had earned a college degree or higher.

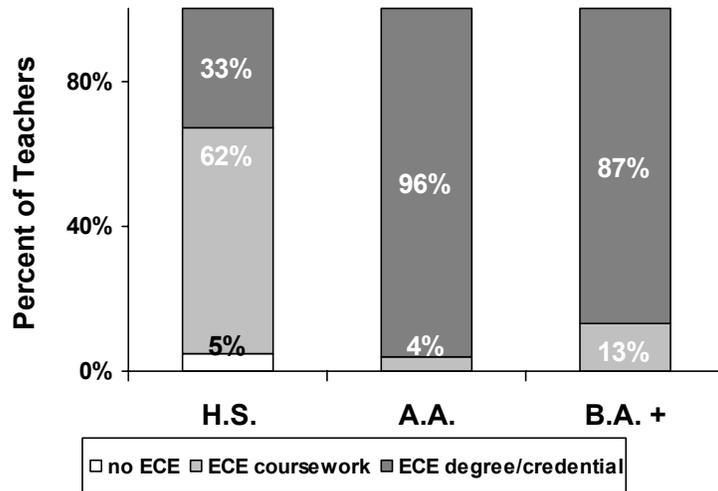
**Figure 2: Teacher Education by Job Title**



About one-third of teachers in the sample had a high school diploma/GED and another third had completed some college courses. Almost 16% of teachers had an Associates Degree or CDA and another 18% had earned a four-year college degree or higher. The state of Maine requires that teachers have at least a high school diploma/GED. Ninety-nine percent of teachers in Maine met this requirement. Almost half, 49%, of the assistant teachers and aides reported that a high school diploma/GED was the highest level of education completed.

Almost all of the teaching staff had some coursework in early childhood education or a related field. Among those with degrees, most teachers held degrees in early childhood education (see Figure 3).

**Figure 3: Early Childhood Coursework & Degrees**

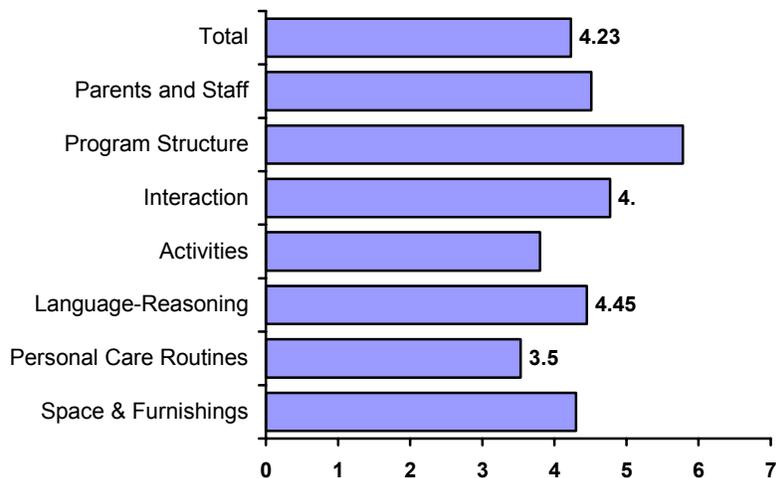


**Process Characteristics of Quality**

While structural characteristics tell us part of the story, process characteristics of quality tell us more about what actually happens in the classroom – how stimulating an environment it is, how teachers and children interact, what the materials and physical space are like, how safe it is.

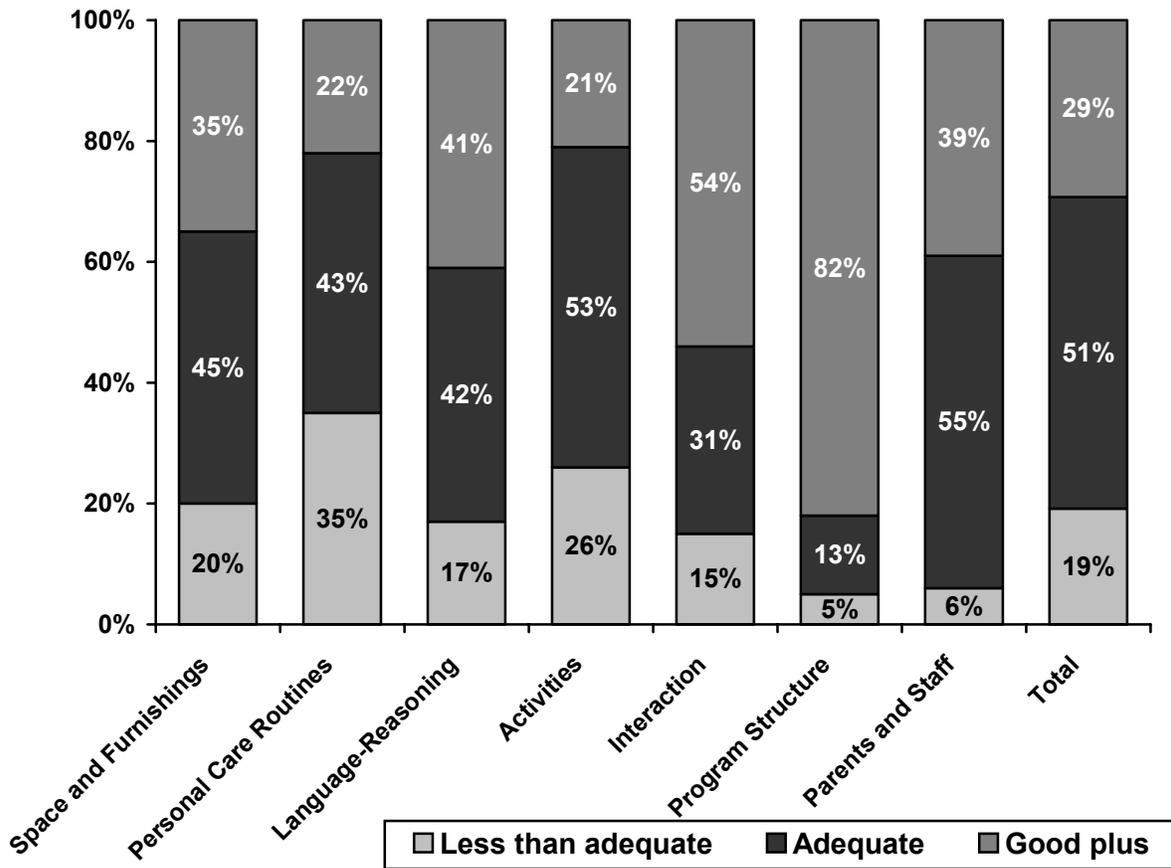
The Early Childhood Environment Rating Scale (ECERS-R) is a commonly used measure of process quality that provides benchmarks for different levels of quality – as described in the previous section. These benchmarks are labeled 1 = inadequate care, 3 = minimally adequate care, 5 = good care and 7 = excellent care.

**Figure 4: Average Subscale and Total ECERS-R Scales**



The average total score for classrooms in the study was below five – below the Good benchmark (see Figure 4). However, averages tell only part of the story. In fact, more than one in four of the classrooms in the sample had total scores of five or greater, meeting or exceeding the Good benchmark (see Figure 5). However, the majority of classrooms, 51%, scored within the three to four range, indicating less than Good quality care. Of particular concern, almost one in five of the classrooms had a total score of less than three, indicating “Inadequate” quality of care.

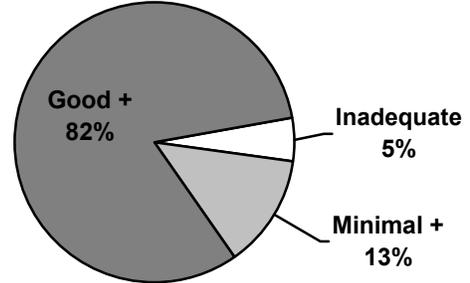
**Figure 5: Percent of Centers Meeting Benchmarks on ECERS-R Scales**



The strengths and weaknesses of Maine classrooms are even more evident when we examine the proportion of classrooms that met the Good benchmark (a 5 or higher) on each of these subscales (see Figure 5). More than three-fourths of classrooms met the Good benchmark on Program Structure and over half of the centers met the Good benchmark for Interactions. In addition, around 40 percent of programs reached the Good benchmark for Language and Reasoning and Parents and Staff while only about one-fifth of the programs met the Good benchmark for Personal Care Routines and Activities and just over a third of centers met the Good benchmark for Space and Furnishings. We examine each of these scales in greater detail in the following sections, starting with the areas in which Maine’s centers exhibit the greatest strengths.

**Program Structure.** The average score was 5.78 on the Program Structure subscale –well above the Good benchmark with a total of 82% of the classrooms reaching the Good benchmark. Only 5% of programs failed to meet the Minimal standards on this subscale. The Program Structure subscale is a measure of the predictability and variability of the structure of daily activities. A classroom that meets Minimal standards, has a basic schedule that is familiar to the children, and includes some variety of activities throughout the day, including some time in small groups or in individual activities. In contrast, a classroom that meets the Good benchmark balances structure and flexibility in the daily schedule, with more time spent in small groups or individual activities, including some activities that are child-initiated. Staff are involved in children’s play appropriately, and make modifications as needed so that children with special needs can participate.

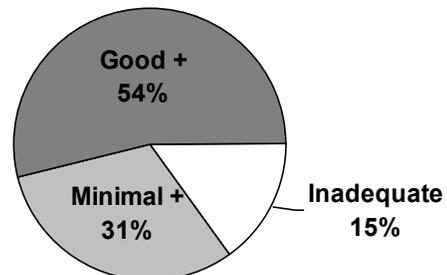
**Figure 6: Percent of Centers Meeting Program Structure Benchmarks**



More than 80% of the classrooms received a score of 5 or better, on the Program Schedule scale of the ECERS-R. The majority of Maine’s full-day preschool classrooms appear to be doing a good job of providing a varied and flexible structure to the day.

**Interactions.** The average score was 4.77 on the Interactions subscale – just below the Good benchmark. Over half of the classrooms, 54%, met the Good benchmark. Approximately thirty percent of the centers met the Minimal standards benchmark for Interactions, but did not meet the Good benchmark; 15% failed to meet even Minimal standards.

**Figure 7: Percent of Centers Meeting Interactions Benchmarks**



The Interactions scale is a measure of the quality of interactions between staff and children, and among the children themselves. A classroom that meets Minimal standards is one in which staff supervision is adequate to keep the children safe, there are some positive interactions between staff and children, without the use of harsh discipline styles, and children are encouraged to interact with each other in a positive manner.

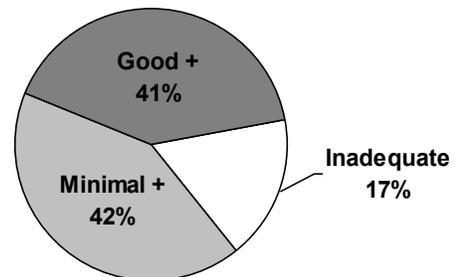
A classroom that meets the Good

benchmark goes beyond this, with staff acting preventively to avoid unsafe situations, paying attention to the whole group even when working with a small group or an individual child, using such non-punitive discipline methods as redirecting children from unacceptable to acceptable behaviors, showing warmth and respect for the children, and modeling good social skills.

Over half of the classrooms met the Good benchmark on the Interactions scale of the ECERS-R. Interactions in these classrooms were characterized by staff who modeled good social skills, showed warmth and respect for the children, and used such non-punitive discipline methods as redirecting children from unacceptable to acceptable behaviors.

**Language-Reasoning.** The average score was 4.45 on the Language-Reasoning subscale of the ECERS-R – between Minimal and Good. Just over 40% of the classrooms in the sample were rated as Good quality or better on Language-Reasoning. Forty-two percent of classrooms met minimal standards and 17% percent of centers failed to meet minimal standards of quality.

**Figure 8: Percent of Centers Meeting Language-Reasoning Benchmarks**



The Language-Reasoning scale is a measure of the books available for the children, how those books are used, and the communication and language skills that are used and encouraged in the setting. A score below five (Good) on this scale indicates a classroom that does not have a wide variety of books and other language materials available to the children for a large portion of the day and where staff do not frequently encourage communication and reasoning skills. For example, a classroom that meets Minimal standards on the Books and Pictures item of this scale has some books available for the children and at least one daily staff-initiated receptive language activity such as storytelling.

On the other hand, to meet the Good benchmark, a classroom must have other language materials such as flannel boards or picture card games available, the books and other language materials must be developmentally appropriate, and staff must read to children informally rather than only at scheduled times. Thus for ratings of Good, there are not only more materials required but also the staff must integrate language and reasoning skills into all areas of the program.

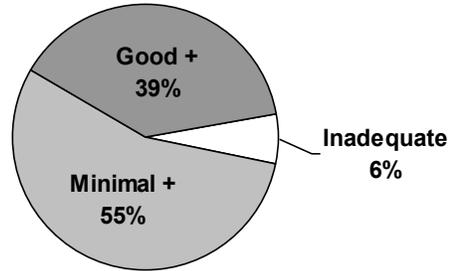
**Parents and Staff.** The average score was 4.51 on the Parents and Staff subscale – just below the Good benchmark. A total of 39% scored at the Good benchmark or better. Fifty-five percent of centers met the Minimal standards benchmark; while only 6% of programs failed to meet Minimal standards.

The Parents and Staff scale is a measure of the quality of communication between staff and parents, of the working environment for staff, and of professional development support for staff. A program that meets Minimal standards is one in which programs provide written information about the program to parents, share child-related information between parents and staff, and one in which interactions between parents and staff are generally respectful and positive. The Minimal work environment is one in which staff have a separate adult bathroom, and at least one break per 8-hour work day, with access to a telephone, storage space, and individual conference space. Staff also receive some staff supervision and in-service training, and attend some staff meetings to handle administrative concerns.

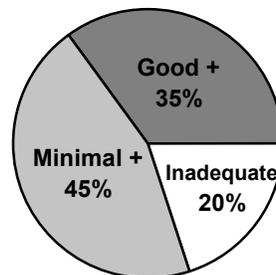
A classroom that meets the Good benchmark is one in which there is more extensive involvement of parents/guardians, including the sharing of information about the philosophy and approaches of the program. In addition, staff communicate effectively and supportively with each other, with monthly staff meetings that include staff development activities. Staff have a staff lounge area (which may be shared with administrative space) and three breaks in an 8-hour day, plus an annual supervisory observation and written evaluation, as well as regular in-service training.

**Space and Furnishings.** The average score was 4.3 on the Space and Furnishings subscale. A total of 35% of the classrooms met the Good benchmark (5 or higher). Forty-five percent of the centers met the minimal benchmark and scored between a 3 and 4. One in five centers (20%) did not meet minimal standards. The Space and Furnishings scale is a measure of the physical setting. A classroom that meets Minimal standards is one in which there is enough space and

**Figure 9: Percent of Centers Meeting Parents & Staff Benchmarks**



**Figure 10: Percent of Centers Meeting Space & Furnishings Benchmarks**

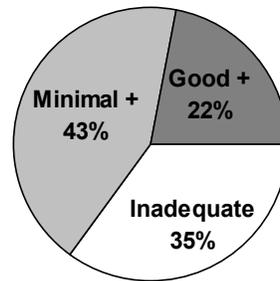


basic furniture for children and adults, and it is in good repair; there is adequate lighting and ventilation, and some age-appropriate play equipment is available. In contrast, a classroom that meets the Good benchmark provides ample space with room for children to move around freely, and the space is pleasantly decorated with children’s artwork or photos of recent activities. In addition, the space and furnishings are arranged in a way that facilitates play and minimizes disruptions with well-defined activity centers and traffic patterns that do not interfere with play.

**Personal Care Routines.** The average score was 3.53 on the Personal Care Routines scale. Only 22 percent of classrooms met the Good benchmark on this subscale. Most of the centers’ (43%) scores fell between a three (Minimal care) and a 4 and just over 20% of the centers’ scores fell below Minimal care.

The Personal Care Routines scale is a measure of the quality of care routines for meals, naps and toileting, and separations and reunions with parents or guardians at drop-off and pick-up. A classroom that meets Minimal standards is one in which no major hazards are present in the classroom, most children are greeted warmly on arrival and their departure is well-organized, and children’s personal care needs are attended to in a non-punitive manner, and at scheduled times that meet the needs of most or all of the children. In addition, sanitary conditions are maintained by the provider during meals, nap and toileting and the spread of germs minimized.

**Figure 11: Percent of Centers Meeting Personal Care Routines Benchmarks**



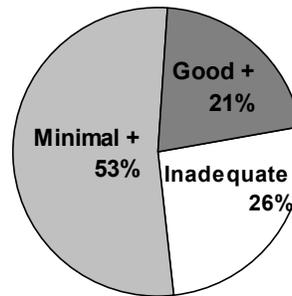
A classroom that meets the Good benchmark goes beyond this. Staff greet children individually by name, welcome parents in the classroom and greet them warmly, and have pleasant departure routines. Personal care routines are designed not just to meet basic needs and sanitary conditions, but to allow pleasant social interactions between staff and children, and among the children. At mealtimes, most staff sit with the children, and children are encouraged to eat independently with child-appropriate utensils. At nap times, staff help children to relax, with soft music, cuddly toys or back rubs, and the nap space is quiet and arranged in a way that helps children to rest. Staff also model good health practices around personal care routines (washing hands, wiping noses, covering mouth when coughing).

Over three-quarters of the classrooms did not meet the Good benchmark on Personal Care Routines. While 40% of classrooms met Minimal standards of tending to meals, naps, and toileting in a non-punitive manner and in a way that met the needs of most of the children, over 20% of centers were rated as Inadequate.

**Activities.** The average score on the Activities scale was just under 4 – indicating Minimal quality. Only 21% of the classrooms had a score of Good or better. Over half, 53%, of the classrooms were rated as Minimal or between Minimal and Good and 26% were rated as Inadequate.

The Activities scale is a measure of the types and variety of materials and activities available for the children such as fine motor materials, art, music, sand & water play, and dramatic play. A score below five (i.e., not meeting the Good benchmark) indicates a classroom that is lacking in many of these activities and materials. A classroom rated as Good provides a greater range of materials and activities, and uses everyday events as the basis for learning, for example, talking about the change of seasons, counting while climbing the steps.

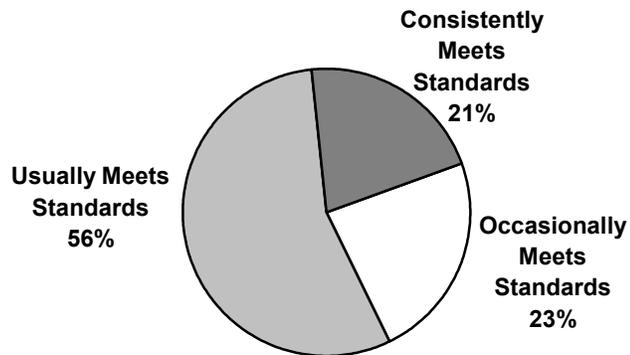
**Figure 12: Percent of Centers Meeting Activities Benchmarks**



**Global Caregiving Rating Scale.** Classrooms were also rated on the Global Caregiving Rating Scale (Arnett, 1989), which rates the caregiver’s relationship with the child in terms of overall sensitivity, harshness, detachment and permissiveness. The scale consists of 26 items, rated on a scale from 1=never meets the standard to 4=consistently meets the standard. The total score is the average of the ratings on all 26 items.

None of the teachers received a total score of 1 in the Maine sample. However, 23% of the teachers had an average score that was lower than a 3; on most items they were rated as only occasionally meeting the standard (see Figure 13). For example, a teacher with a total score below 3 might have been rated as “Is often critical of the children, but there are times when she is not critical;” and “Often does not listen attentively, but there are some moments when she does listen;” and

**Figure 13: Percent of Classrooms Meeting Global Caregiving Standards**

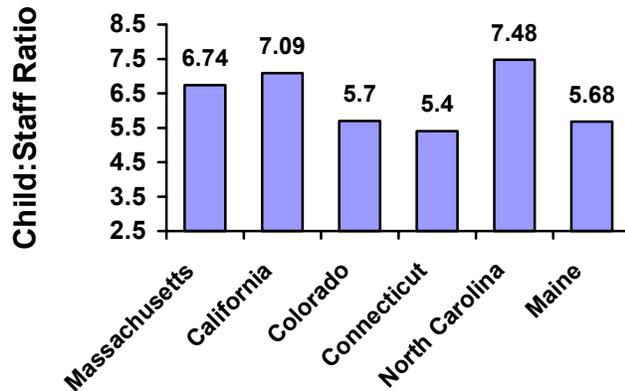


“Usually does not seem to enjoy the children, but there are a few instances of enjoyment;” and “Usually does not supervise the children very closely, but there are times when she does make an effort to keep them in her sight or hearing;” and “Usually does not talk to children on a level appropriate for their developmental level, but in a few instances does talk at a level children understand.” In contrast, 21% of teachers received high marks (a total score between 3.5 and 4); these teachers were rated as “Never or rarely critical of the children;” “Usually or consistently listen attentively to the children;” “Usually or consistently seem to enjoy the children;” “Usually or consistently supervise the children appropriately;” and “Usually or consistently talk to children on a level they can understand.” The remaining 55% of the teachers had average scores that fell between 3 and 3.5; they were rated as usually meeting standards, but not consistently meeting a majority of the standards.

## Maine Compared to Other States

To place these findings in context, we compared this study of Maine preschool classrooms to other studies done in multiple states. The Cost, Quality and Outcomes Study (Helburn 1995) included full-day, full-year centers in four states: California, Colorado, Connecticut and North Carolina. In addition, the Massachusetts Cost and Quality study included community based full-day preschool centers throughout Massachusetts. The Maine Cost and Quality Study used many of the same measures so that we would be able to compare the quality of early care and education for preschool-age children in Maine to the quality of early care and education in these five states.

**Figure 14: State Comparison of Average Observed Child:Staff Ratios**

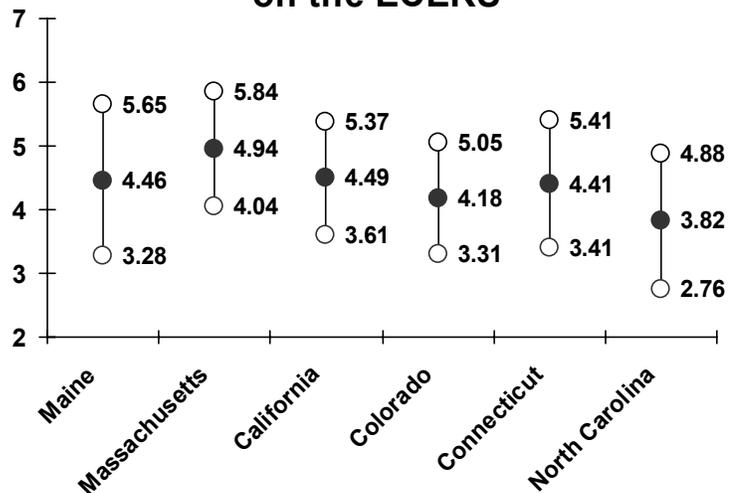


First, we compared one structural measure of quality, child: staff ratio, to Massachusetts and the four states in the Cost, Quality and Outcomes Study (Helburn, 1995). The average observed ratio for Maine’s centers is comparable to the ratios found in these other states, Maine’s observed child:staff ratios compare favorably with those of Massachusetts, California and North Carolina, with fewer children per staff member.

Figure 15 shows the range within each state on the ECERS scores. The bottom point of each line is one standard deviation above the mean score.

Figure 15 also provides a picture of *overlap* in ECERS scores across the states. Averages tell only part of the story. The average ECERS-R total score for the Maine sample falls in the middle of other states’ total ECERS scores. The average rating for the Maine centers was 4.23 compared to average scores ranging from 3.82 to 4.94 for the five states in other similar studies. However, when we look at the range, we see that Maine’s best centers score higher than 4 out of 5 other states.

**Figure 15: State Comparisons on the ECERS**



## Improving the Quality of Preschool Care and Education in Maine

As we noted earlier, there are two main aspects of quality of care that we measured: structural and process. Many of the structural aspects of quality can be, and are, regulated by states. Process characteristics are not easily regulated but help us to understand the environments in which children spend their time, and are directly related to children's development. To the extent that regulatable structural indicators of quality are related to process quality – to what happens in the classroom – regulations can improve children's outcomes. To understand how such regulatables are related to process, we examined the relationship between several structural variables and our process measures: stimulation in the classroom, the teacher-child relationship, and the ECERS-R total score.

We used three structural variables that are most often subject to state regulations:

- child:staff ratio;
- group size; and
- teaching staff education (measured as average years of education).

Table 1 reports the estimates of the extent to which an increment in each of these structural variables is associated with an increment in the observed quality of preschool care and education in Maine. Because the estimates are standardized, they can be compared to each other, both within each model, and across models. We will discuss each of these models in turn.

The table also reports the significance level ( $p$ ) of each estimate—that is, the probability that this estimate is an artifact of the particular sample of homes that were chosen for this study (and would not be found in a different sample), rather than representing the true relationship among structural variables and process quality in all full-day preschool classrooms in Maine.<sup>1</sup> Finally, the table reports the  $R^2$  for each model (column);  $R^2$  is the proportion of the variation in the process quality measure that is explained by all of the listed regulatables combined.

**Regulatables and Stimulation.** We examined the relationships between the structural variables and the quality of the stimulation provided in the classroom. The *Stimulation* composite is a measure of the amount and variety of activities available to the children, the developmental appropriateness of the classroom structure, the amount and appropriateness of the language in the classroom, and how actively classroom staff introduce stimulation into the environment. Higher scores signify more stimulating classrooms. As Table 1 shows, classrooms in centers with more highly educated

<sup>1</sup> For example, an estimate that is significant at the  $p < .05$  level has five chances out of 100 of being due to chance. Put another way, that same estimate has 95 chances out of 100 of representing the true value for all Maine full-day preschool classrooms. In this report, we treat as significant those estimates that have at least 95 chances out of 100 of being valid ( $p < .05$ );  $p$  values  $< .10$  are interpreted as marginally significant.

teachers provided higher levels of age-appropriate stimulation.

However, after considering the role of teacher education, child:staff ratios and group size were not significant predictors of the quality of the stimulation provided. However, this does not mean that ratios and group size are not important. Rather, within the current regulatory environment in Maine, the observed ranges of ratios and group size were not associated with differences in the quality of Maine programs.

Table 1. Standardized Estimates of Relationships Between Regulatables and Process Quality Measures

	Stimulation Composite	Warmth & Sensitivity	Total ECERS-R
Child:Staff Ratio	-.13	-.17*	-.10
Group Size	.05	.02	.03
Teacher Education	.42 **	.42**	.37 **
R <sup>2</sup>	.42* *	.14**	.15**

\* =  $p < .05$ , \*\* =  $p < .01$

**Regulatables and the Teacher-Child Relationship.** We also examined the relationships between regulatables and specific aspects of teachers' interactions with children. The Warmth and Sensitivity composite describes how providers interact with the children in the classroom, how warm they are to the children, the amount and types of interactions that occur, and how sensitive they are to children's needs. High scores signify a classroom where providers interact often and appropriately with the children, show warmth to the children, and respond to children's needs.

Similar to Stimulation, higher levels of teacher education were associated with increased sensitivity among staff and child interactions. In addition, child:staff ratios significantly impacted Warmth & Sensitivity scores of classrooms. When child:staff ratios were lower, providers interactions were more likely to be warm and sensitive.

**Regulatables and Total ECERS-R scores.** When we examine the associations between total ECERS-R scores and measures of structural quality, we again see that teacher education is a significant predictor. Classrooms with more educated teachers tended to exhibit higher levels of overall process quality, as measures by the ECERS-R. Child:staff ratios also showed some relationship to scores on the ECERS-R, although child:staff ratios was not a significant predictor of ECERS-R scores, when teacher education was also considered in the model.

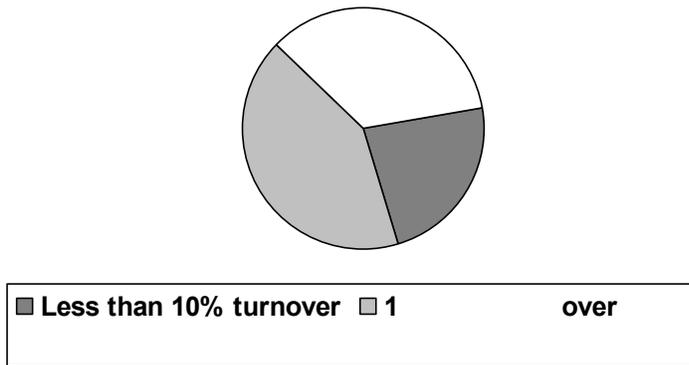
**Teacher Turnover.** While qualified teachers are clearly an important part of quality early care and education, center directors reported that it was difficult to retain teaching staff. The majority of centers reported that more than 10% of their staff had left in the previous year; about a third of centers reported that more than a third of their staff had

Teacher education was the signal greatest predictor of Stimulation, Warmth & Sensitivity and total ECERS-R scores among preschool school classrooms in Maine. Classrooms with better educated teachers provided higher levels of age-appropriate stimulation, had teaching staff who exhibited greater levels of warmth and sensitivity and scored higher on overall measures of process quality as indicated by the ECERS-R. In addition, teaching staff in classrooms with better child:staff ratios provided greater warmth and sensitivity to the children.

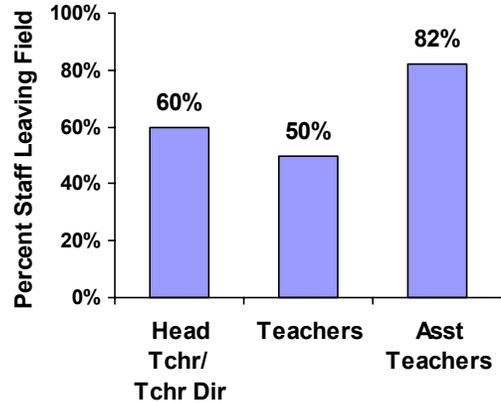
left in the previous year (See Figure 16).

Some of the teaching staff left to take positions in other centers, preschool classrooms or other early childhood education settings, but, across job titles, about 66% of those who left for another job took a position outside the field of early care and education – this was especially likely for assistant teachers, although even among head teachers/teacher directors, the field exit rate was 60% (see Figure 17).

**Figure 16: Percent of Centers Reporting Specific Turnover Rates**

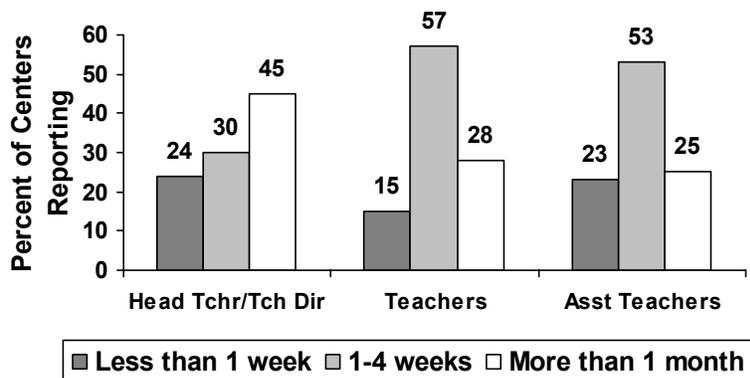


**Figure 17: Exit Rates**



When teaching staff left, it often took more than one month to hire a replacement, particularly for their more qualified staff. Center directors reported that it took more than one month to hire a replacement for 45% of their most recent head teacher vacancies and 28% of their most recent teacher vacancies (Figure 18). In addition, 27% of newly-hired head teachers, 16% of newly-hired teachers and 19% of newly-hired assistant teachers were less qualified than their predecessors.

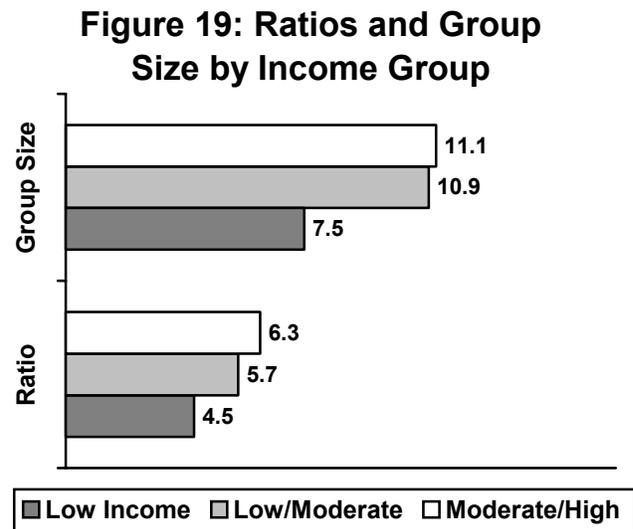
**Figure 18: Time to Fill Most Recent Vacancy**



## Family Income and the Quality of Early Care and Education

A central issue surrounding quality child care is whether low-income children attend centers of comparable quality to those that serve children from higher-income families. Specifically, we were interested in whether centers serving children from families with different income levels differed in the quality of early care and education they provided. We categorized centers into three income groups. Low-income centers were defined as those in which directors reported that at least 75% of the children come from families with incomes below \$30,000 per year. Low/moderate income centers are those in which at least 75% of the children come from families with incomes below \$60,000 per year (but not 75% below \$30,000). Moderate/high income centers are those in which at least 50% of children come from families with incomes over \$30,000 (and they do not meet the criteria for low/moderate classification) or 40% or more of the children come from families with incomes over \$60,000.

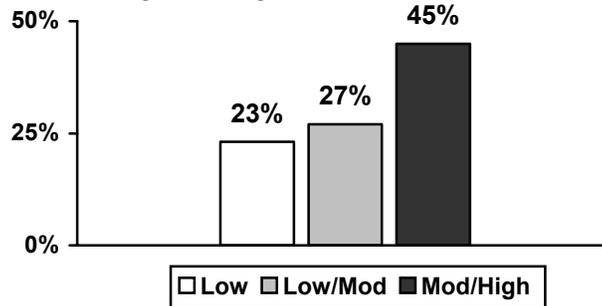
**Regulatable Indicators of Quality.** We examined the quality indicators separately by income level to understand whether children from different income categories were receiving comparable levels of care (see Figure 19). While all licensed centers are subject to the same regulations, individual centers may choose to maintain smaller child:staff ratios or to hire more qualified teachers and assistant teachers. Results indicated that differences in child:staff ratio and group size exist between centers serving different income level families. Interestingly, centers serving mostly low income families have smaller average group sizes and the lowest child:staff ratios, on average, compared to centers serving either low/moderate income or centers serving moderate/high income families.



**Process Quality.** While centers serving predominantly low income groups have small ratios and small group sizes, only 23% met or exceeded the Good benchmark on the ECERS-R. Centers serving low/moderate income families are comparable, with only 27% meeting or exceeding the Good benchmark. In contrast, we found that 45% of centers serving a majority of moderate/high income families met or exceeded the Good benchmark on the total ECERS-R score (see Figure 20). When we examined individual scale scores, we found that the greatest gaps between income groups appear to be on three subscales: Language and Reasoning, Activities and Interactions. The average Language-Reasoning score for centers serving low-income families was 4.42 and 4.21 for centers serving moderate/high income families. This is in contrast to centers serving primarily moderate/high income families which tend to meet or exceed the Good benchmark, averaging a 5.39 on the language-reasoning subscale. The average Interactions score for centers serving low-income families and low/moderate income

families was 3.9 and 3.57, respectively. Centers serving primarily moderate/high income families tended to meet the Good benchmark with an average score of 5.52. The average Interactions score for centers serving primarily low-income families and low/moderate income families was 4.42 and 4.62, respectively. In comparison, centers serving moderate/high income families averaged a score of 5.52.

**Figure 20: Percent Centers Meeting Good Benchmark by Family Income Served**



### Summary

This study was undertaken to provide a picture of the quality of Maine early care and education for preschoolers. The impetus for this study came from previous research that found that both structural and process quality make a difference in children's development. Child:staff ratios and teacher education and training have been found to be related to children's development in several studies (c.f., Howes, Phillips & Whitebook 1992; NICHD ECCRN 1999). These regulatable measures impact children's lives through their links to process quality – the actual experiences of children in classrooms (NICHD ECCRN 2001). Higher process quality, including age-appropriate stimulation, as well as sensitive and responsive caregiving, has been found to be associated with better developmental outcomes in most studies of early care and education, including the Bermuda Study (McCartney 1984; Phillips, McCartney & Scarr 1987); the Chicago Study (Clarke-Stewart, Gruber & Fitzgerald 1994); the Child Care and Family Study (Kontos, Howes, Shim & Galinsky 1995); the Cost, Quality and Outcomes Study (Peisner-Feinberg & Burchinal 1997) and the NICHD Study of Early Child Care (NICHD ECCRN 1998, 2000a).

Recent research on brain development, coupled with rising concerns about school readiness, has fueled an interest in the ways in which early care and education can support young children's cognitive and language development. The research on early child care clearly indicates that child care can play an important role. Children who attend child care centers that offer high quality care, particularly more language stimulation, show more advanced cognitive and language development (Burchinal, Roberts, Riggins et al, 2000; NICHD ECCRN 2000).

The early years are also crucial years for the development of social skills – the ability to make friends, to get along well with others, to cooperate in group activities, to understand others' perspectives – skills that are necessary to the development of self-esteem and social relationships, and to later school success. Research has found that higher process quality is associated with young children's social and emotional development (c.f., Lamb 1998). The quality and stability of children's relationships with their child care providers appears to be particularly important to children's social and

emotional development (c.f., Howes & Hamilton 1992, 1993; Howes, Matheson & Hamilton 1994).

The cumulative evidence of the research on early child care and children's development is clear; for children in child care, the quality of that care is consistently associated with children's development. As the National Research Council notes (2000, pg. 313), "...high-quality care is associated with outcomes that all parents want to see in their children, ranging from cooperation with adults to the ability to initiate and sustain positive exchanges with peers, to early competence in math and reading."

On average, full-day, year-round Maine early care and education for preschoolers received a rating that falls between Minimal and Good Quality care on the ECERS-R. Maine falls in the middle of the range of scores from comparable studies of several other states. Like other states, many of Maine's preschool classrooms do not meet established standards for quality early care and education programs.

In fact, 70% of classrooms did not meet the ECERS-R benchmark for Good quality care. In addition, almost 1 in 5 of these centers did not meet the Minimal standard for care. Children in these classrooms are receiving less than the standards set for developmentally-appropriate care; even when they are in care that meets minimal standards, many opportunities to enhance their development are being missed. Many children are in care for 8 to 10 hours a day, and this care could be an ideal opportunity to enrich their lives.

Maine's performance is uneven across different areas of early care and education practice. More than three-fourths of the centers in the sample met the Good benchmark on Program Structure and more than half of the centers met the Good benchmark on Interactions among children and between teachers and children. However, almost 80% of classrooms were rated as less than Good quality on the Activities scale and approximately 60% of classrooms were rated as less than Good quality on the Language-Reasoning scale. These classrooms do not provide the rich language environment that research has found is essential to children's language and cognitive development, and that is related to later school success. Nor do they provide the variety of activities that would give children the opportunity to explore and learn about their environment. In addition, over three-fourths of the programs failed to meet the Good benchmark for Personal Care Routines, indicating that practices in the classrooms surrounding meals, naps and toileting, and separations and reunions with parents or guardians at drop-off and pick-up are an area of needed focus.

Maine's performance is also uneven across centers serving different income groups. We found that centers that serve predominantly low- or low/moderate income families were rated as poorer quality than centers that serve predominantly moderate/high income families, despite the fact that centers serving primarily low- or low-moderate income families tended to have smaller group sizes and child:staff ratios. The centers serving predominantly low-income or low/moderate income families scored lower on the Language-Reasoning, Activities and Interactions subscales. The activities and staff behaviors that are necessary to meet the Good benchmarks on these scales are precisely those behaviors that have been shown to be linked to better child outcomes. Children attending centers that serve predominantly low-income or low/moderate

families are less likely to receive the quality of early care and education that will prepare them for school and later life.

How can Maine ensure that all children have access to quality early care and education, and that centers provide the stimulation and strong teacher-child relationships important to children's development? There are many options to be considered, and this study was not designed to evaluate specific policies. However, we found that centers with better educated teachers provided better quality care overall, including more developmentally-appropriate stimulation, and better relationships between classroom staff and children.

## Revenues, Expenditures and Full Costs

In this section we present descriptive data on *center revenues* (parent fees, government subsidies and other income) and the *costs of center care* for preschool aged children. These data come from an interview which collected information from center directors on general center characteristics, enrollment, staffing, sources of income, and expenditures. The findings in this section are based on 90 centers.

It is useful to distinguish between *expenditures* and *full costs*. Expenditures comprise centers' actual outlays over the course of a year. These are typically less than the full costs incurred for center care, because many centers are able to obtain resources – such as food or space -- at below-market rates. Their operations may be subsidized in other ways as well, for example, through the receipt of goods and services from parent organizations. Full costs include the true cost of these additional resources. It is important to consider full costs as well as expenditures. If one wants to expand early care and education slots by replicating existing centers, one should expect to pay the true market cost for inputs.

For comparability, all costs and revenues have been expressed in terms of dollars per child care hour. For illustrative purposes, we also calculate the cost of care for a hypothetical child in full-time care, defined as 45 hours per week, for 52 weeks a year. The data in these analyses have been weighted to adjust for sampling probability, ineligibility for this study, and non-response to produce statistics representative of the entire state.

**Revenues** were grouped in the following categories:

- parent fees
- state and federal government subsidies: government food program funds, government non-food program funds
- fundraising and foundation grants, including nonprofit and community donations
- other, including sponsoring organization contributions: funds from churches or synagogues, non-profit agencies, employers or other sponsors.

**Expenditures** were classified as:

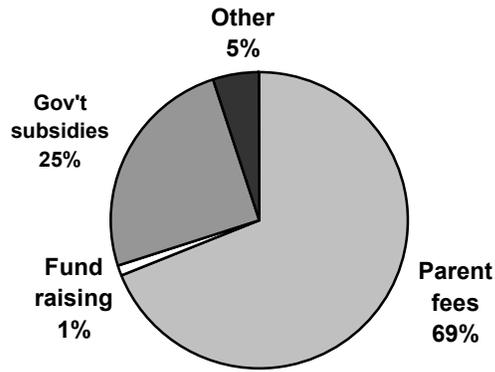
- labor: salaries and wages, fringe benefits and payroll taxes
- occupancy: rent or mortgage
- food
- other: office supplies, insurance, professional fees, professional development, repairs and maintenance, contractual services, educational supplies, advertising, utilities, miscellaneous.

**Full Costs** exceed expenditures by the value of goods and services used by centers beyond what they pay for out of pocket. One example is space that is made available for free or below market rent. A second example is in-kind contribution of meals or other goods and services.

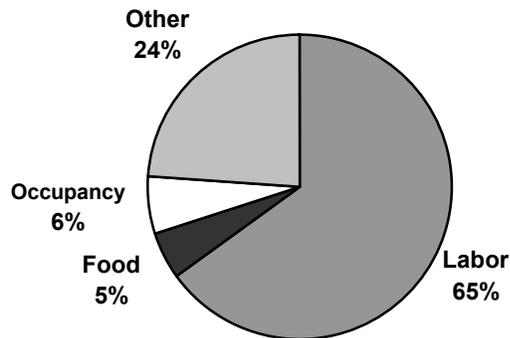
## Revenues

Across all centers in the sample, the average revenue per child care hour was \$2.61.<sup>2</sup> This is equivalent to \$6,043 per year for one child in full-time care. *Parent fees*, averaging \$1.80 per child care hour, comprise 69% of total revenues, on average. *Government subsidies* contribute 25% of revenues, on average. The remaining 6% of revenues come from two sources: 1% from fundraising and foundation grants and 5% from other sources such as sponsoring organizations. It is important to note that the actual distribution of revenue sources varied from center to center, but these figures provide a picture of the funding streams for the Maine system of full-day, year-round centers.

**Figure 21: Revenue Sources**



**Figure 22: Expenditures**



## Expenditures

Expenditures average \$2.76 per hour of care provided. This is the equivalent of \$6,383 per year for a child in full-time care.

**Labor expenditures.** Labor expenditures comprise 65% of center expenditures, averaging \$1.83 per child hour. Directors were asked for salaries and wages for all teaching staff. To make salaries and wages comparable for staff working part-time and full-time, we computed the mean hourly wage for teaching staff (those who spent more

than 75% of their paid time in the classroom). Teaching staff with more education received higher wages, ranging from \$6.26 per hour for those with less than a high school degree to \$13.57 for those with a master's degree.

<sup>2</sup> Revenues and expenditures are expressed in units of “child care hour.” Centers provide care to multiple children; we capture this quantity of services by calculating the number of hours of care provided for each child, and then summing the total hours of care provided across all children – or “child hours of care.” By using this unit, we are able to compare revenues and expenditures across centers that vary in the number of children they serve and in hours of operation.

**Non-labor expenditures.** The single largest component of non-labor expenditures is occupancy expenditures (rent or mortgage payments). The mean occupancy expenditure is \$0.17 per child hour. However, occupancy expenditures vary considerably (see the following section for more detail). Food expenditures comprise \$0.13 per child hour, while other expenses average \$0.64 per child hour.

## **Full Costs**

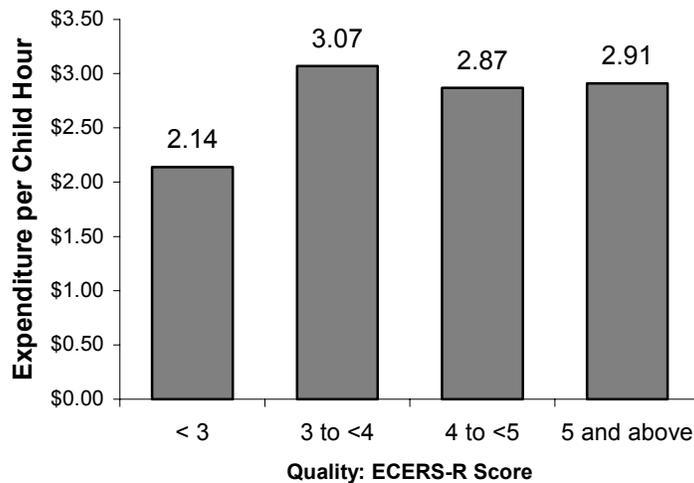
Annual expenditures do not correspond to the full cost of operating a center. Centers may receive goods and services from parent organizations and may benefit from volunteer workers and in-kind donations. There were large differences between centers' expenditures and their true costs for food, space (occupancy) and other costs. Centers did not, however, rely on in-kind or subsidized labor costs—full costs for labor did not differ from expenditures. Factoring in the in-kind donations that centers receive, as below-market rents and other contributions, raises the average cost of care by about 6 percent, to \$2.92 per child hour.

This section of the report examines the relationship between *preschool classroom* quality and *center* costs.<sup>3</sup> To understand the relationship between cost and quality, it is important to consider not only structural and process measures of quality, but also other factors that may be related to costs and/or quality, such as the local labor markets and local markets for commercial space, as well as variations in center characteristics, such as size, for-profit status or participation in a multi-service or sponsoring organization. Before we discuss these more complex, multivariate models, we first examine average costs among groups of centers varying in structural and process measures of quality.

**Comparing Quality and Cost.** In our quality analyses in earlier sections of this report, we found that higher process quality was predicted by better ratios (fewer children per staff member), and better educated staff. Given what we know about labor costs, we would expect that each of these factors is associated with higher center costs.

A simple comparison of expenditures (measured per child care hour) and quality of care, as measured by ECERS-R scores, suggests that care that achieves at least “minimal” quality (ECERS of 3 or above) is more expensive than care that does not achieve this level (Figure 23). However, there do not appear to be any real differences in costs among centers that meet or exceed the Minimal benchmark.

**Figure 23: Expenditures per Child Hour by Quality**



<sup>3</sup> We would have preferred to estimate costs at the classroom level as well, but the data did not support this. Instead, we follow the practices of the original Cost, Quality and Outcomes study (Helburn et al. 1996), and estimate costs at the center level. Using center-level costs and classroom-level quality measures is not unreasonable if classrooms within one center are of similar levels of quality – that is, if centers that have relatively high quality in the observed preschool classrooms tend to have relatively high quality in other rooms. As a partial test of this, we examined the relationship between the ECERS scores for the preschool classrooms in the Cost, Quality and Outcomes study and the ITERs scores for the infant/toddler classrooms in those same centers. We found that two classrooms in the same center did tend to meet similar benchmarks ( $X^2 = 45.05, p < .01$ ). The analyses in the following sections use modified full costs (excluding occupancy costs), not just expenditures. Because of the uncertainty inherent in estimating the value of rent subsidies, and the likelihood that centers would use less space if they had to pay for it at the going rate, we have used actual rent paid, rather than estimated market rents (see Appendix).

## A Multivariate Model

While this pattern is suggestive, it is not conclusive, because centers may vary in many ways that affect cost and quality. A multivariate model was estimated which took account of the following factors:

- Child hours of care (economies of scale): measured as total child care hours per year.
- Occupancy cost: measured as price of space per square foot (e.g., rent).
- Urban *versus* rural (proxy for labor costs, other cost differences): measure developed by Economic Research Service which, for Maine counties, ranges from 3 (county in metropolitan area of fewer than 250,000 population: Androscoggin, Cumberland) to 9 (nonmetropolitan county, completely rural or less than 2,500 metropolitan population, not adjacent to metropolitan area: Lincoln).
- For-profit status.
- Enrollment of 40 or more (to capture extra administrative costs incurred by larger centers due to state regulations).
- Inclusion in a organization providing other services, besides child care (to capture cross-subsidization of child care costs).
- Presence of infants and toddlers (which may lead to higher overall costs for the center).
- NAEYC accreditation (which may lead to additional costs or indicate variations in quality among higher quality centers that are not captured by the ECERS scores).

Centers that achieve at least a minimal level of quality have expenses that are 17 percent higher than centers with similar characteristics that do not meet at least a minimal level of quality ( $p < 0.05$ ). There are considerable *returns to scale*: doubling the size of a center reduces the cost for providing minimal quality by 33 percent ( $p < 0.01$ ). Centers facing higher *space costs* do incur greater expenses, with an elasticity of 31 percent ( $p < 0.01$ ), but, once given the cost of space, their total expenses do not vary further by urban/rural status.

Membership in an *organization that provides other services* reduces expenses of the child care programs by 20 percent ( $p < 0.05$ ), while serving infants and/or toddlers raises expenses by 22 percent ( $p < 0.01$ ). *NAEYC accreditation* is associated with a very large increase in expenses, of 45 percent ( $p < 0.01$ ). But note that *none* of the centers with less than Minimal quality are accredited. So NAEYC accreditation is differentiating costs only among the higher quality centers with ECERS scores of at least 3. In follow-up analyses, we found that *NAEYC accreditation* is more strongly associated with non-labor costs than with labor costs, suggesting that NAEYC accreditation raises costs because of extra administrative or material costs of accredited

centers, rather than because accredited centers pay higher salaries for staff of similar quality.

## Implications

Using the data from this sample of centers, we found significantly higher costs for centers that achieve at least “minimal” quality (ECERS of 3 or above) in comparison to centers that do not reach this benchmark. Labor costs, occupancy costs, NAEYC accreditation and serving infants and toddlers are factors that significantly raise costs of providing care to preschoolers.

These data present compelling evidence that providing higher quality early care and education is associated with greater costs. This study also provides an estimate of the additional costs involved in operating preschool care and education programs, if all centers in Maine met at least the Minimal benchmark on the ECERS. However, these cost analyses do not indicate what it would cost to raise the quality of existing centers to that level of quality.

Improvements in quality may be attainable through a variety of methods which vary in cost. However, the quality analyses in this study indicate that teacher education is the single structural indicator that is linked to the quality of early care and education in full-day centers. We would expect that raising the standards for teacher education would raise the quality of care provided. Given that teachers with higher education are paid more, and that labor costs are the single largest component of centers’ expenditures, raising standards for teacher education would also raise the costs of running programs.

Currently, parents pay about two-thirds of the costs of full-day, year-round programs. While we do not have data on the affordability of child care in Maine, national data indicates that most parents, particularly low- and moderate-income families, can not afford to pay more than they already do. Government subsidies currently support 25% of the total costs of full-day, year-round child care centers in Maine; raising the quality of child care centers will most likely require an increase in government subsidies for child care centers, particularly for low- and moderate-income families.

If the state of Maine wishes to provide quality of full-day, year-round child care, centers must be able to spend real resources to hire qualified teachers. Families can not bear this additional cost alone; government subsidies are a necessary part of the strategy to ensure that all of Maine’s children receive the quality of early care and education that is necessary to prepare them for school and later life.

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