



# The Current State of Scientific Knowledge on Pre-Kindergarten Effects

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A North Carolina Perspective

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Helen (Sunny) Ladd, Susan B. King Professor of Public Policy Studies and Professor of Economics, Duke University Sanford School of Public Policy

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Richard (Dick) Clifford, Co-Director, First School Initiative, Frank Porter Graham Child Development Institute, University of North Carolina - Chapel Hill

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Anita Brown-Graham, Program Director and Professor of Public Law and Government, University of North Carolina School of Government

## Q & A

Facilitated by Ken Dodge

## Meet the Expert Presenters



### Anita Brown-Graham

Anita Brown-Graham rejoined the UNC School of Government in September 2016 to lead the public launch of a special initiative that seeks to expand the School's capacity to work with public officials on policy issues that affect North Carolina communities.

Brown-Graham's first tour as a faculty member was from 1994-2006, when she covered the areas of civil liability and community and economic development aimed at revitalizing communities. In 2007 Brown-Graham became the director of the Institute for Emerging Issues (IEI) at NC State University. There, she led IEI's work to build North Carolina's capacity for economic development and prosperity. Each year, she and her colleagues at IEI worked with leaders across the state in business, government and higher education to focus on issues important to our state's future. Brown-Graham began her career as a law clerk to the Honorable William B. Shubb in the Eastern District of California and as business litigation counsel in a Sacramento, CA, law firm. She is a William C. Friday Fellow, American Marshall Fellow, and Eisenhower Fellow.

In 2013, the White House named her a Champion of Change for her work at IEI, and the Triangle Business Journal named her a 2014 Woman in Business for her policy leadership in the state. She also currently serves on the boards of several organizations. Brown-Graham earned an undergraduate degree from Louisiana State University and a law degree from the University of North Carolina at Chapel Hill.



### Richard (Dick) Clifford

Richard (Dick) Clifford has written extensively on child and family policy issues, with a particular emphasis on the role of government in the provision and financing of services. In addition, he has conducted research assessing early learning environments and identifying developmentally appropriate practices in early care and education. Clifford is past president of the National Association for the Education of Young Children (NAEYC). He is currently co-director of the First School Initiative at the FPG Child Development Institute, University of North Carolina at Chapel Hill.



### Kenneth (Ken) Dodge

Kenneth (Ken) Dodge is the William McDougall Professor of Public Policy and Professor of Psychology and Neuroscience at Duke University, where he founded the Center for Child and Family Policy. He is a leading scholar in early child development and prevention of problem behaviors. He is trained as a clinical and developmental psychologist, having earned his B.A. in psychology at Northwestern University in 1975 and his Ph.D. in psychology at Duke University in 1978. He has developed Durham Connects, a universal postnatal home-visiting program which has been shown to decrease emergency care costs in an infant's first year of life. With colleagues, he has evaluated the impact of North Carolina's pre-kindergarten programs. Dodge has published more than 500 scientific articles which have been cited more than 77,000 times. He was elected into the National Academy of Medicine in 2015.



### Helen (Sunny) Ladd

Helen (Sunny) F. Ladd is the Susan B. King Professor of Public Policy Studies and Professor of Economics at Duke University's Sanford School of Public Policy. Most of her current research focuses on education policy. She is particularly interested in various aspects of school accountability, education finance, teacher labor markets, and school choice. She has written numerous articles on charter schools and other forms of choice in North Carolina, self-governing schools and parental choice in New Zealand, market based reforms in urban school districts, voucher programs, school reform in post-Apartheid South Africa, and school finance in the Netherlands.

In addition, with colleagues at Duke University she has written extensively about school segregation, teacher labor markets, and teacher quality using longitudinal data in North Carolina. She has co-edited and co-authored many books. Among them are *Holding Schools Accountable: Performance-Based Reform in Education* (Brookings Institution, 1996); *The Handbook of Research in Education Finance and Policy* (Routledge, 2008; second edition, 2015) and books on school reform in New Zealand and South Africa.



### Clara Muschkin

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Clara Muschkin is an associate research professor of public policy and director of the North Carolina Education Research Data Center (NCERDC), located within the Center for Child and Family Policy at Duke University. The mission of the NCERDC is to support and develop policy-oriented research on education, providing academic researchers with access to a wealth of data on North Carolina public schools, students, and teachers. Muschkin is a sociologist and demographer with an interdisciplinary research focus. In her research, she asks how education policies that influence the composition and organization of educational institutions can influence outcomes for individual students as they progress through school. Her current research focuses on the impact of early childhood education policies on academic skills, special education placements, and grade retention among students in the elementary grades. These studies also explore the relationship between access to early learning and educational disparities by gender and family background.



### Ellen Peisner-Feinberg

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Ellen Peisner-Feinberg is a senior scientist at the Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill. She has over 25 years of research experience in early childhood education and program evaluation, and has conducted numerous statewide and national studies focused on the quality of early education programs and initiatives; the effects on children, especially dual-language learners and children at risk; and quality improvement strategies.

She is director of the National Pre-K and Early Learning Evaluation Center and has conducted several statewide evaluations of pre-kindergarten programs, currently including studies of the North Carolina Pre-Kindergarten Program since its inception and Georgia's Pre-K Program. She also currently co-directs a program of research on Recognition & Response (R&R), an early-education model based on principles of response to intervention (RTI).

Peisner-Feinberg has been involved in several national research efforts as well, including a national center examining research issues for young dual-language learners; a national research consortium that studied quality issues in Head Start and served as a technical advisory panel for key

national studies (FACES and Head Start Impact Study); and the Cost, Quality, and Child Outcomes in Child Care Centers Project (CQO), one of the most well-known large-scale studies of center-based child care and children's development and school success from the preschool years through the end of elementary school. She has disseminated this work to a variety of audiences and authored numerous publications, including co-editing a recent handbook on RTI in early childhood.



### Lynne Vernon-Feagans

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Lynne Vernon-Feagans, William C. Friday Distinguished Professor of Applied Developmental Science and Special Education as well as professor of psychology, has spent the last 40 years focused on children at risk - especially African-American children who live in poverty. Vernon-Feagans leads the NICHD multi-site, multi-disciplinary birth cohort study that has followed a representative sample of 1,292 children from low-wealth counties. This landmark study collects in-depth measures of parenting, health, childcare, and school, as well as child cognition, language, EF, and academic achievement. Vernon-Feagans and colleagues have also developed the Targeted Reading Intervention (TRI) which, in a series of IES-funded RCTs, is now one of the few evidence-based early literacy programs for struggling readers. The TRI helps classroom teachers individualize instruction for struggling readers with the help of webcam literacy coaches who watch them delivering the TRI and give the teachers real-time feedback while being extremely cost effective.

## National Pre-K Research

### The Current State of Scientific Knowledge on Pre-Kindergarten Effects

New Research from Brookings and Duke Center for Child and Family Policy



A Pre-Kindergarten Task Force of interdisciplinary scientists reviewed the evidence on the impact of state-funded pre-kindergarten programs. Members included: Deborah A. Phillips of Georgetown University, Mark W. Lipsey of Vanderbilt University, Kenneth A. Dodge of Duke University, Ron Haskins of the Brookings Institution,

Daphna Bassok of the University of Virginia, Margaret R. Burchinal of the University of North Carolina at Chapel Hill, Greg J. Duncan of the University of California-Irvine, Mark Dynarski of the Brookings Institution, Katherine A. Magnuson of the University of Wisconsin-Madison, and Christina Weiland of the University of Michigan.

### Consensus Statement from the Pre-Kindergarten Task Force

- Studies of different groups of preschoolers often find greater improvement in learning at the end of the pre-k year for economically disadvantaged children and dual language learners than for more advantaged and English-proficient children.
- Pre-k programs are not all equally effective. Several effectiveness factors may be at work in the most successful programs. One such factor supporting early learning is a well implemented, evidence-based curriculum. Coaching for teachers, as well as efforts to promote orderly but active classrooms, may also be helpful.
- Children's early learning trajectories depend on the quality of their learning experiences not only before and during their pre-k year, but also following the pre-k year. Classroom experiences early in elementary school can serve as charging stations for sustaining and amplifying pre-k learning gains. One good bet for powering up later learning is elementary school classrooms that provide individualization and differentiation in instructional content and strategies.



### Consensus of National Pre-K Experts

- Ensuring that young children benefit from their early learning experiences is essential to building a strong and productive society.
- Pre-k programs are not all equally effective.
- Children attending a diverse array of pre-k programs are more ready for school at the end of their pre-k year than children who do not attend pre-k.
- Improvement in learning at the end of the pre-k year is greater for economically disadvantaged children and dual language learners.
- Continued implementation of scaled-up pre-k programs is in order, as long as the implementation is accompanied by rigorous evaluation of impact.

- Convincing evidence shows that children attending a diverse array of state and school district pre-k programs are more ready for school at the end of their pre-k year than children who do not attend pre-k. Improvements in academic areas such as literacy and numeracy are most common; the smaller number of studies of social-emotional and self-regulatory development generally show more modest improvements in those areas.
- Convincing evidence on the longer-term impacts of scaled-up pre-k programs on academic outcomes and school progress is sparse, precluding broad conclusions. The evidence that does exist often shows that pre-k-induced improvements in learning are detectable during elementary school, but studies also reveal null or negative longer-term impacts for some programs.
- States have displayed considerable ingenuity in designing and implementing their pre-k programs. Ongoing innovation and evaluation are needed during and after pre-k to ensure continued improvement in creating and sustaining children's learning gains. Research-practice partnerships are a promising way of achieving this goal. These kinds of efforts are needed to generate more complete and reliable evidence on effectiveness factors in pre-k and elementary school that generate long-run impacts.
- In conclusion, the scientific rationale, the uniformly positive evidence of impact on kindergarten readiness, and the nascent body of ongoing inquiry about long-term impacts lead us to conclude that continued implementation of scaled-up pre-k programs is in order as long as the implementation is accompanied by rigorous evaluation of impact.

## Brookings Report Table of Contents

### Overview

The Current Landscape for Public Pre-Kindergarten Programs

*Ajay Chaudry and A. Rupa Datta*

### A consensus statement

Puzzling It Out: The Current State of Scientific Knowledge on Pre-Kindergarten Effects

*Deborah A. Phillips, Mark Lipsey, Kenneth A. Dodge, Ron Haskins, Daphna Bassok, Margaret R. Burchinal, Greg J. Duncan, Mark Dynarski, Katherine A. Magnuson and Christina Weiland*

### Issues and challenges

Do Some Groups of Children Benefit More Than Others from Pre-Kindergarten Programs?

*Helen F. Ladd*

Do Pre-Kindergarten Curricula Matter?

*Jade Marcus Jenkins and Greg J. Duncan*

Characteristics of Pre-Kindergarten Programs That Drive Positive Outcomes

*Dale C. Farran*

Universal vs. Targeted Pre-Kindergarten: Reflections for Policymakers

*William Gormley*

The Costs and Benefits of Scaled-Up Pre-Kindergarten Programs

*Lynn A. Karoly*

Challenges to Scaling Up Effective Pre-Kindergarten Programs

*W. Steven Barnett*

The Promise of Preschool Education: Challenges in Policy and Governance

*Ajay Chaudry*

Financing Early Childhood Programs

*Ron Haskins*

Reframing Early Childhood Education: A Means to Public Understanding and Support

*Craig T. Ramey and Sharon Landesman Ramey*

Bibliography of Studies on the Effects of State- and District-Funded Pre-Kindergarten Programs for the Consensus Statement

Contributors

# Pre-K in North Carolina at a Glance

## North Carolina Rankings

- North Carolina is ranked number one for the quality of its pre-K program, NC Pre-K.<sup>1</sup>
- North Carolina is ranked 41st for enrollment in preschool programs.<sup>2</sup>

<sup>1</sup> U.S. News and World Report, 2017.

<sup>2</sup> Id.

## Pre-K Savings

Participation in NC Pre-K:

- Reduces placements in special education classes by 32%.
- Reduced placements = savings of \$358 per student in third grade.
- Within three years, North Carolina will have a net savings from initial NC Pre-K investment.
- Within four years after the initial investment, net savings to North Carolina = \$46 million.

## Participation in NC Pre-K

- According to the General Assembly, 29,400 North Carolina four-year-olds participated in NC Pre-K in 2016.
- Over 66,000 children are eligible for the program based on income alone.<sup>1</sup>

### Long-term savings

Participation in NC Pre-K results in a savings of \$358 per student in third grade.

## Pre-K by the numbers

For the 2015 - 2016 school year, roughly 66,000 children were deemed eligible for NC Pre-K.

- Over 36,000 of children - or 55% of eligible North Carolina four-year-olds - are not being served.<sup>2</sup>
- The number of children under age five in North Carolina is predicted to reach 760,000 by 2020 - a 41% increase from 2000.

<sup>1</sup> This number increases when children with an identified disability, a chronic health condition, dual language learners, and those from military families are considered.

<sup>2</sup> The gross number of unserved children also increases when eligibility requirements other than just income are considered.

## Cost for a Pre-K Slot<sup>1</sup>

Total Average Cost.....	\$9,126
State Funding (61%).....	\$5,567
Private/Public Partners <sup>2</sup> .....	\$3,559

<sup>1</sup> Per 2017 report to the General Assembly from NC Division of Child Development and Early Education (DHHS) and the Department of Public Instruction.

<sup>2</sup> These funds typically come from the following sources: Head Start, Title I, preschool/early childhood funds, child and adult care food programs, Smart Start, and local funds, such as foundations, business, and nonprofit organizations.

## Facts on NC Pre-K

1. NC Pre-K serves eligible four-year-olds in all counties in North Carolina.<sup>1</sup>
2. Eligibility<sup>2</sup>
  - Gross family income at or below 75% of the state median income (\$50,133 for a family of four – just over 220% of the Federal Poverty Level)
  - Children from families with higher incomes if the child has limited English proficiency, an identified disability, a chronic health condition, or developmental/education needs.
  - Family is in the military.
3. For the 2015 – 2016 school year, roughly 66,000 children were deemed eligible.<sup>3</sup>
  - During that same school year, 29,400 children were actually served.<sup>4</sup>
  - Thus, at least 36,600 eligible children are not being served.
4. Enrollment has fallen from 35,000 in 2010 to 29,400 in 2016.<sup>5</sup>
5. An NC Pre-K school day is 6½ hours, 180 days per year (@ 10 months).<sup>6</sup>
6. Class size is limited to 18, with an adult/child ratio of 1:9.<sup>7</sup>
7. Annual cost to the state in 2016 was \$5,100 per child.<sup>8</sup>
8. A Quality Rating and Improvement System (QRIS) is built into the state licensing system, with subsidy reimbursements tiered based on a center's QRIS rating.<sup>9</sup>
9. State funding is provided only to 4- and 5-star rated centers.<sup>10</sup>
10. 75% of the classrooms were 4- or 5-star level for the 2015-16 school year.<sup>11</sup>
11. North Carolina is one of only 6 states that meets all 10 quality benchmarks set by the National Institute of Early Education Research (NIEER).
12. Teacher education and credentials in North Carolina have steadily increased, with virtually all North Carolina teachers having attained the requisite education and/or credentials.<sup>12</sup>

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<sup>1</sup> Division of Child Development and Early Education, NC Department of Health and Human Services.

<sup>2</sup> Id.

<sup>3</sup> Calculation from NC Child's analysis of children eligible based upon income only.

<sup>4</sup> DHHS records show the number to have been 27,019.

<sup>5</sup> National Institute for Early Education Research (NIEER).

<sup>6</sup> Division of Child Development and Early Education, NC Department of Health and Human Services.

<sup>7</sup> Id.

<sup>8</sup> A new study from DPI/DHHS states that the total cost is \$9,100 per child, with the difference being covered by Smart Start, federal funds (Head Start and Title I), and local funds.

<sup>9</sup> Division of Child Development and Early Education, NC Department of Health and Human Services.

<sup>10</sup> Id.

<sup>11</sup> Id.

<sup>12</sup> National Institute for Early Education Research (NIEER).

# North Carolina Pre-K Research

## Impact of North Carolina's Early Childhood Programs and Policies on Educational Outcomes in Elementary School

Center for Child and Family Policy  
Duke University, November 2016

### Background

In this study, NC Pre-K and Smart Start were evaluated across 13 years, following children through age 11 (end of elementary school) in each of North Carolina's 100 counties. This study has, to date, involved approximately 1 million children. It took advantage of the fact that state funding levels varied across counties and across years. The researchers asked the policymakers' question: Does the level of state funding allocated for each of these programs to a particular county in a particular year influence the educational outcomes for the children living in those counties and years?

### Primary findings

1. Both NC Pre-K and Smart Start are associated with:
  - Higher math and reading standardized test scores in grades 3, 4, and 5.
  - Reductions in special education placement rates in grades 3, 4, and 5.
  - Reductions in being grade-retained in grades 3, 4 and 5.

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### Measurable impact

Children in NC Pre-K have:

- Higher math and reading standardized test scores.
- Reductions in special education placement rates.
- Less retentions in grades 3, 4 and 5.

2. These positive impacts hold steady or significantly increase through 5th grade. Unlike some other pre-K programs in other states, the positive impacts of NC Pre-K do not "fade out."
3. The impacts of each program were positive for all subgroups of children studied and were especially favorable for children receiving free or reduced lunch.
4. Because children benefit from being in classrooms with peers who are ready to learn, the positive impact of NC Pre-K extends beyond those children who receive a "pre-k slot" to other children. This effect is called "spillover."
5. A greater benefit-cost ratio is likely as the financial benefits continue across grade levels due to reduced special education and grade-retention costs.
6. Early childhood programs do not operate as "immunizations" against subsequent environmental adversity.

### Bottom line

Full implementation of NC Pre-K should lead to significant impacts that persist through at least the end of elementary school.

## Impact of North Carolina's Early Childhood Initiatives on Special Education Placements in Third Grade

Center for Child and Family Policy  
Duke University, 2015

### Background

This study examined how investments in NC Pre-K impacted the placement of children into special education classes in third grade. The study utilized the same design as "Impact of NC's Early Childhood Programs and Policies on Educational Outcomes in Elementary School."

### Primary findings

1. Participation in NC Pre-K reduces placements in special education classes by 32%.
2. This reduction of 32% represents a savings of \$358 per student enrolled in the third grade across the state of North Carolina.
3. This per pupil savings will result in a net savings to North Carolina, at current state funding levels for NC Pre-K, within three years of an investment in the program for a single cohort of four-year-olds.
4. Four years after the initial NC Pre-K investment, Duke University estimates that reduced placements in special education classes will result in a net savings to North Carolina of \$46 million.
5. These net savings to North Carolina are likely even greater when one considers that many students receive special education services in grades prior to third grade. The savings per child from investments in NC Pre-K from reduced special education placements under this scenario is \$1,348 per child.



## What Does NC Pre-K Cost?

In 2016, the General Assembly passed legislation requiring the North Carolina Department of Health and Human Services, Division of Child Development and Early Education (DCDEE), in consultation with the Department of Public Instruction (DPI), to study the cost and effectiveness of NC Pre-K. It mandated that DCDEE submit a report on findings and recommendations by February 1, 2017.

The report is online at <http://wp.me/a4fX8m-FB>.

This Fact Sheet outlines the findings of the report submitted by DCDEE.

## What is NC Pre-K?

Since 2001, North Carolina has provided full school day, target public pre-kindergarten, now known as NC Pre-K (formerly More at Four). NC Pre-K slots and classrooms are located in three types of sites: private and non-profit child care, public schools, and Head Start facilities. Classrooms maintain at least a 1 to 9 staff-to-child ratio, with a maximum of 18 children per class. Programs must provide breakfast or a morning snack along with a lunch that meets USDA requirements.

At the local level, NC Pre-K Advisory Committees oversee the program, including developing operational policies and procedures, providing programmatic and fiscal oversight, and ensuring collaboration and shared responsibility for developing and implementing plans to deliver services. The local committees are represented by a mix of local school boards and systems, local Smart Start partnerships, licensed child care providers, Head Start, local departments of social services, parents of pre-school-age children, county cooperative extension agencies, and child care resource and referral agencies.

## Does NC Pre-K work?

Yes. More than 14 years of research studies of NC Pre-K found that it has demonstrated positive outcomes for children in key domains of learning for later school success, including language development and communication; cognitive development; and social and emotional development. Classroom quality scores related to global quality, teacher-child instructional interactions, language and literacy environment, and teacher sensitivity range from medium to high in NC Pre-K classroom evaluations. Improvement efforts should focus on overall classroom quality and instruction for dual language learners. There have been substantial improvements in teacher qualifications, with 99 percent of lead teachers holding a BA or four-year degree.

In the latest evaluation of NC Pre-K, researchers found that children are progressing at an even greater rate during their participation in NC Pre-K than expected for normal developmental growth.<sup>1</sup> NC Pre-K produces lasting benefits for children, including higher test scores, less grade retention and fewer special education placement through fifth grade.<sup>2</sup>

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<sup>1</sup> Peisner-Feinberg, E. S., Schaaf, J. M., Hildebrandt, L. M., Pan, Y., & Warnaar, B. L. (2015). Children's kindergarten outcomes and program quality in the North Carolina Pre-Kindergarten Program: 2013-2014 statewide evaluation. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute.

<sup>2</sup> "Impact of North Carolina's Early Childhood Programs and Policies on Educational Outcomes In Elementary School," Kenneth A. Dodge, Yu Bai, Helen F. Ladd, Clara G. Muschkin. Child Development, November 2016. DOI: 10.1111/cdev.12645.

## Is the number of slots the same as the number of children served?

No. A slot represents the amount of funding for NC Pre-K services for a child per school year (10 months). More than one child can fill a slot: if one child leaves NC Pre-K and another child fills that slot during the same school year, then that slot is the equivalent of two children.

## How much does NC Pre-K cost?

State funding does not cover the full cost of NC Pre-K. This is intentional. NC Pre-K requires that programs demonstrate that they are using other funds to maximize resources (blended funding).

NC Pre-K contractors report using the following types of funds to cover the full cost of NC Pre-K:

- Smart Start
- Head Start
- Title I
- Preschool Early Childhood Funds
- Child and Adult Care Food Program
- Local Funds

## State Funding

State funding is provided through a maximum monthly reimbursement rate per slot. The three types of settings that host NC Pre-K slots - Head Start programs, public schools, and private and non-profit child care facilities - receive different reimbursement rates. The rationale for the different rates is outlined in the table below.

### Maximum Monthly Reimbursement Rates Per Slot by Setting

Setting	Maximum Monthly Reimbursement Rate Per Slot	Rationale
Head Start	\$400	Estimated based on additional costs needed to meet NC Pre-K requirements, including extending Head Start operating hours, increased teacher qualifications, and a decrease in the maximum number of children allowed per classroom.
Public School	\$473	Estimated based on the average salary of a public school teacher with a Birth-through-Kindergarten license, the average salary of a public school teacher assistant, plus some classroom operating costs, recognizing that operating costs are shared across several programs.
Private Child Care	\$650*	Estimated based on the average lead teacher with a Birth-through-Kindergarten license and teacher assistant salaries, program equipment, occupancy, and other administrative costs.

\* This is the maximum rate if the lead teacher has a Birth-through-Kindergarten License or higher. If the lead teacher has a BA/BS degree or higher and is working toward the Birth-through-Kindergarten license, the maximum rate per slot is \$600.

On average, the overall cost for an NC Pre-K slot is \$9,126, with state funding covering 61 percent of that cost. Cost of the program varies slightly by setting.

#### NC Pre-K Average Costs and Funding by Setting

	Head Start	Public School	Child Care
Average Staffing Expenses per Slot	\$7,082	\$6,379	\$6,541
Average Operating Costs Per Slot*	\$2,114	\$2,752	\$2,548
<b>Total Average Cost per Slot</b>	<b>\$9,197</b>	<b>\$9,131</b>	<b>\$9,088</b>
Average Annual NC Pre-K Funding per Slot**	\$3,964	\$4,777	\$6,257
<b>Percent of Costs Covered by State NC Pre-K Funding</b>	<b>46%</b>	<b>56%</b>	<b>72%</b>

\* To determine the NC Pre-K cost per slot in all sites, the analysis took into account the costs associated with providing education to all pre-kindergartners at the site and not just those enrolled in the NC Pre-K program

\*\* The reimbursement rate structure outlined was implemented by DCDEE in Fiscal Year 2012-13.

#### How much does it cost to administer NC Pre-K?

NC Pre-K is administered locally by Smart Start Local Partnerships, Local Education Agencies (LEAs), or, in a few instances, nonprofit organizations. Funding for NC Pre-K administration is capped at 4 percent of the total contract or \$20,000, whichever is greater. The actual cost to administer NC Pre-K is higher, so administrators must use other funds to oversee the program. The report notes that even the estimated cost of administering NC Pre-K is underreported because:

- Onsite staff time to ensure compliance with NC Pre-K standards is not reimbursed.
- Existing positions, which are not reimbursed, often incorporate NC Pre-K responsibilities.
- Some administrative NC Pre-K costs, such as accounting, property insurance and facility costs, are paid for through supplemental (non-NC Pre-K) funding.
- Costs incurred during screening, determining child eligibility and consulting with families are often not captured in dollars and not reimbursed.
- Schools do not typically allocate to individual programs indirect staff costs, such as IT/computer support, payroll support, accounts payable support, human resources and finance/contracting/monitoring support, so those costs are not represented in the overall NC Pre-K administrative costs. Those costs are included in Smart Start administrative costs.

In addition, the report notes that although NC Pre-K is a 10-month program, it requires year-round administration.

### NC Pre-K Administration Costs<sup>3</sup>

	Smart Start	Local Education Agencies
<b>Average Monthly NC Pre-K State Funding for Administration Per Slot</b>	<b>\$212.40</b>	
Average Total Annual NC Pre-K State Funding for Administration	\$79,031	\$74,031
Total average cost for all administrative categories (salaries, fringe, mandatory 4 benefits, office costs, agency costs, and costs drivers)	\$148,625	\$143,771
Average Percentage of Administration Funded by the State	53%	51%

<sup>3</sup> Researchers surveyed NC Pre-K administrators to determine which administrative services are supported with supplemental (non-NC Pre-K) dollars.

### What costs are associated with personnel?

Approximately 70 percent of the cost of NC Pre-K is personnel. Teachers in child care settings earn substantially less than their peers in Head Start and public school settings.

	Head Start	Public School	Child Care
Percent of Costs that Are Personnel	77%	72%	72%
Average Lead Teacher Salary*	\$32,986	\$43,565	\$25,372
Average Assistant Teacher Salary	\$20,585	\$21,526	\$20,269

\* The cost analysis model used did not isolate individual classroom costs. Therefore, all lead teacher costs were included in the analysis, not only NC Pre-K teachers.

### What are the additional operating costs?

In addition to personnel, NC Pre-K costs include food, food preparation and facility costs. These costs account for about 30 percent of the total cost per slot.

	Head Start	Public School	Child Care
Average Annual Cost of Food and Preparation Per Slot	\$829	\$1,017	\$913
Average Cost per Square Foot for Facility (Rent/Lease/Mortgage)	\$4.10*	\$0.16*	\$13.61

\* This figure does not include in-kind school contributions.

## What does the report recommend?

- Conduct a follow-up study to analyze revenue available by type of setting (Head Start, public school, or child care) to more accurately set reimbursement rates.
- Consider increasing the cap for administration. NC Pre-K funding covers approximately half of the actual costs of administering the program at an average monthly cost of \$212.40 per slot. The report examines increasing the administrative funding allowable with NC Pre-K dollars from 4 percent to 8 percent (\$425 per slot). The table below shows the estimated increase in average per slot costs.

### Estimated Average Cost Per Slot With Administration Funds Increased to 8 Percent

	Head Start	Public School	Child Care
Current Total Average Cost per Slot	\$9,197	\$9,131	\$9,088
Total Average Cost per Slot With Increased Administrative Funding	\$9,622	\$9,556	\$9,513

\* This figure does not include in-kind school contributions.

If the State were to fund 100 percent of the remaining costs for NC Pre-K - increasing the cap for administration to eight percent - and maintain the existing 27,019 slots, it would require an additional \$47.2 to \$50.2 million in state funds.

- Consider better defining how administrative funds may be used to support local needs.
- Consider other State resources that may be used to offset local costs to administer the program (e.g., Birth-through-Kinderergarten licensure, teacher compensation, and professional development activities).
- Because NC Pre-K supplements state funds with other resources, administrators emphasized that the program's viability is linked to the availability of those funds.

## Data limitation

Many sites did not have all of the requested data readily available. This type of data collection is an intensive process. DCDEE also notes that the state was hit by two natural disasters during the data collection. As a result, many survey respondents replied with default values to use as their estimates of cost. The default values were based on previous research of costs in child care settings.

Special thanks to the NC Division of Child Development and Early Education and NCSU Center for Urban Affairs and Community Services for fact-checking this document.

*This report was prepared by the North Carolina Early Childhood Foundation.*

*North Carolina Early Childhood Foundation is driven by a bold vision: That each North Carolina child has a strong foundation for lifelong health, education and well-being supported by a premiere birth-to-eight system. We promote understanding, spearhead collaboration, and advance policies to ensure each North Carolina child is on track for lifelong success by the end of third grade. Learn more at [www.buildthefoundation.org](http://www.buildthefoundation.org).*

## Effects of Participation in the North Carolina Pre-Kindergarten Program at the End of Kindergarten

2015–2016 Statewide Evaluation  
Executive Summary

### Purpose of the NC Pre-Kindergarten evaluation study

The purpose of the 2015–2016 NC Pre-Kindergarten (NC Pre-K) Evaluation study was to examine the long-term effects of participation in NC Pre-K at the end of kindergarten. Two groups of children were compared – those who attended NC Pre-K (treatment) and those who had not attended NC Pre-K (comparison). Propensity score matching (PSM) was used to select a matched sample of children with similar characteristics across the two groups.

The study included a total sample of 512 children (NC Pre-K=255, non NC Pre-K=257) who attended 135 kindergarten classrooms during the 2015–2016 academic year, including a subsample of 119 children (NC Pre-K=58, non-NC

Pre-K=61) who were Spanish-speaking dual language learners (DLLs). Researchers gathered assessment data in the late spring of kindergarten to examine the effects of participation in NC Pre-K on children’s language, literacy, math, executive function, and behavior skills at the end of kindergarten. For the DLL subsample, skills were measured in both English and Spanish using parallel measures. Parent surveys provided demographic information about the children and families, and teacher surveys provided information about demographic characteristics and classroom characteristics.

In addition, key characteristics of the NC Pre-K Program during the 2015–2016 year, along with trends over time (2003–2004 to 2015–2016), were examined based on statewide administrative data (NC Pre-K Kids and NC Pre-K Plan). Information examined included characteristics of the local NC Pre-K settings, the children served, the qualifications of teachers, and the distributions and counts of program participants and service providers.



## Results

### Treatment effects

Children who attended NC Pre-K performed significantly better on math skills at the end of kindergarten compared to a matched group of children who did not attend NC Pre-K. Children in the NC Pre-K group had higher scores on calculation skills and the math composite, and marginally higher scores on math problem-solving. These results were based on a propensity-score matched sample of over 500 NC Pre-K and non-NC Pre-K children, with effect sizes in the small range (16 - 22).

There was little difference between a matched sample of NC Pre-K and non-NC Pre-K children on language and literacy skills at the end of kindergarten. In contrast to the findings for math skills, there were almost no differences in language and literacy skills, with the exception of one marginally significant finding for phonological awareness skills (effect size = .15). These results are consistent with data from national assessments such as NAEP showing relatively stronger performance in math than reading for NC students in later grades.

Participation in NC Pre-K had positive effects on children's executive function at the end of kindergarten for both the full sample and the DLL subsample. Children who attended NC Pre-K performed better on a measure of executive function related to working memory compared to their peers who did not attend NC Pre-K. The effect sizes for these

### Improved math skills

Children who attended NC Pre-K performed significantly better on math skills at the end of kindergarten compared to a matched group of children who did not attend NC Pre-K.

results were in the small range (17) for the full matched sample of over 500 children and in the medium range (39) for the subsample of over 100 Spanish-speaking DLLs. These results are important, because executive function is predictive of children's later academic performance.

### Program characteristics

Many of the characteristics of the NC Pre-K Program were consistent with good quality standards, as well as with program guidelines. In 2015 - 2016, the average NC Pre-K class included a total of 16 children, with 13 (85%) funded by NC Pre-K. This number is actually below the program guidelines which specify a maximum class size of 18. The majority of the programs (78%) were at the highest, five-star licensing level, with another 17% at the four-star level. The average days of child attendance was 140 days (81% of the average days of operation).



In general, most program characteristics have been fairly stable over time. In 2015 - 2016, the NC Pre-K Program served nearly 29,000 children in over 1,900 classrooms located in more than 1,100 sites. The majority of children were from low-income families (90% qualified for free or reduced-price lunch). There were no changes over time in setting types, with about half in public schools, about one-third in private settings, and 16% in Head Start. Children's prior placement also has remained consistent over time; over 70% of the children had never been served or were currently unserved in a preschool setting.

One continuing trend in the NC Pre-K Program has been improvement in the levels of teacher education and credentials. There have been significant trends toward increasing teacher education and licensure levels, and a significant decreasing trend in those with no credential over the past 13 years, since NC Pre-K became a statewide program. In 2015-2016, almost all NC Pre-K lead teachers had at least a bachelor's degree in both public school and private settings (>99%). Nearly all lead teachers in public schools and over three-quarters in private settings had a B-K license, while relatively few teachers had no credential.

## Overview of the NC Pre-Kindergarten Program

NC Pre-K is a state-funded educational program for eligible 4-year-olds, designed to enhance their school readiness skills. Initiated in 2001-2002, the statewide pre-k program has served over 350,000 children, with an average annual cost per child of approximately \$5,000. Children are eligible for NC Pre-K primarily based on age (4 years old) and family income (up to 75% of state median income), although children with higher family incomes may be enrolled with at least one of the following risk factors: limited English proficiency, identified disability, chronic health condition, or educational need; or a parent actively serving in the military. NC Pre-K provides funding for serving eligible children in classroom-based educational programs in a variety of setting types, including public schools, Head Start,

and private child care centers (both for-profit and nonprofit). NC Pre-K operates on a school schedule for 6 1/2 hours/day and 180 days/year. Local sites are expected to meet a variety of program standards around curriculum, screening and assessment, training and education levels for teachers and administrators, class size, adult:child ratios, North Carolina child care licensing levels, and provision of other program services.

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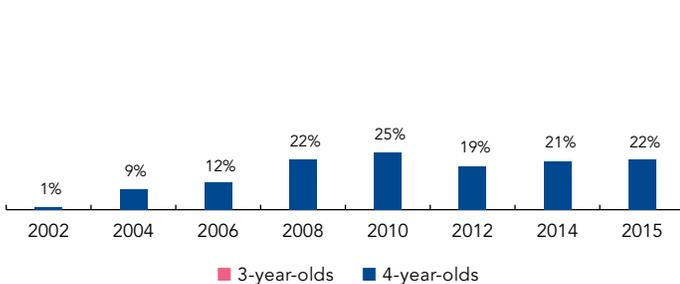
This report is available at <http://www.fpg.unc.edu/projects/evaluation-nc-pre-kindergarten-program>

# NIEER Report

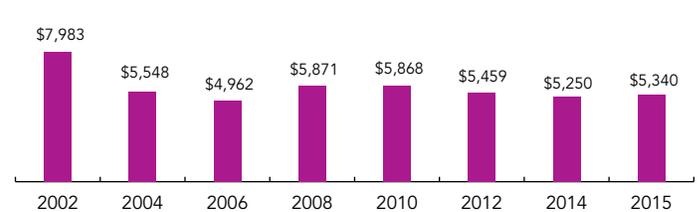
## 2015 State of Preschool Yearbook: North Carolina Pre-K Program Profile

# North Carolina

PERCENT OF STATE POPULATION ENROLLED\*



STATE SPENDING PER CHILD ENROLLED\*  
(2015 DOLLARS)



Since 2001, North Carolina has provided state-funded pre-kindergarten education, originally via the More at Four Pre-Kindergarten Program, now through the NC Pre-Kindergarten (NC Pre-K) Program. The NC Pre-K Program delivers a high-quality educational experience during the year prior to kindergarten entry, enrolling at-risk 4-year-olds from low-income families who have not participated in other early childhood programs. At-risk children are identified based on a number of factors, which include having a developmental delay or identified disability, coming from a family with an income at or below 75% of the state median income, having a chronic health condition, or having limited English proficiency. Similarly, children whose parents are active duty military personnel are automatically eligible for the program.

Funding for the state pre-K program comes from two primary sources—state appropriations and North Carolina Education Lottery receipts—and federal funds, and a required (no amount specified) contribution from local sources. During the 2011-2012 school year, administrative control of the program was relocated from the Department of Public Instruction to the Department of Health and Human Services, and the program was renamed the NC Pre-Kindergarten Program. It is required to meet the same high-quality program standards that were in place for the More at Four Pre-Kindergarten Program. Approximately \$18.8 million in one-time funds that were available in SFY 2011-2012 were not available in SFY 2012-2013; however, in 2013-2014, \$12.4 million in recurring funds were added to the program, making it possible to serve more children than originally anticipated for that year.

NC Pre-K classrooms are available statewide in private licensed Head Start programs, child-care centers, and public schools. All programs must earn high-quality ratings under the state child-care licensing system to qualify for participation in pre-K and the state's subsidy system. Program standards set for NC Pre-K must be met in both public and nonpublic settings.

Lead teachers must have a bachelor's degree and a Birth-through-Kindergarten License. Teachers in private classrooms may begin with a BS/BA degree in a related field as long as they meet BK licensure requirements within a specified timeframe, defined by the NC State Board of Education teacher licensure policy, for a program to continue receiving NC Pre-K funds. NC Pre-K is evaluated annually for process quality, program impact, and child outcomes, by an independent external evaluator. The state legislature mandated an increase in teacher salaries across all grade levels (K-12) for licensed public school employees for 2014-2015. This includes public school pre-K teachers who hold BK Licensure. Although not mandated, NC Pre-K Program Requirements encourage that NC Pre-K BK licensed teachers who work in nonpublic schools be compensated to align with the same schedule. DCDEE is currently studying the impact to counties.

In 2012, the state was awarded a Race to the Top—Early Learning Challenge grant.

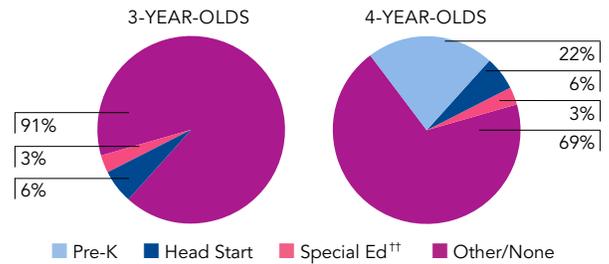
ACCESS RANKINGS		RESOURCES RANKINGS		POLICIES TO SUPPORT	
4-YEAR-OLDS	3-YEAR-OLDS	STATE SPENDING	ALL REPORTED SPENDING	DUAL LANGUAGE LEARNERS	WORKFORCE
24	None Served	16	9	✓	✓

## NORTH CAROLINA PRE-KINDERGARTEN PROGRAM

### ACCESS

Total state program enrollment .....	26,851
School districts that offer state program .....	100% (counties/parishes)
Income requirement .....	75% SMI
Hours of operation .....	6.5 hours/day, 5 days/week
Operating schedule .....	School or academic year
Special education enrollment, ages 3 and 4 .....	10,532
Federally funded Head Start enrollment, ages 3 and 4 .....	18,542
State-funded Head Start enrollment, ages 3 and 4 .....	0

STATE PRE-K AND HEAD START ENROLLMENT AS PERCENTAGE OF TOTAL POPULATION



<sup>††</sup> Estimates children in special education not also enrolled in state pre-K or Head Start.

### QUALITY STANDARDS CHECKLIST

POLICY	STATE PRE-K REQUIREMENT	BENCHMARK	DOES REQUIREMENT MEET BENCHMARK?
Early learning standards .....	Comprehensive	Comprehensive	<input checked="" type="checkbox"/>
Teacher degree .....	BA	BA	<input checked="" type="checkbox"/>
Teacher specialized training .....	NC B-K Lateral Entry License; NC B-K Standard Professional I License; NC B-K Standard Professional II License; NC Preschool/Pre-K/K Add-on License	Specializing in pre-K	<input checked="" type="checkbox"/>
Assistant teacher degree .....	CDA or AA in ECE	CDA or equivalent	<input checked="" type="checkbox"/>
Teacher in-service .....	75 credit hours/5 year BK SPII Licensure cycle	At least 15 hours/year	<input checked="" type="checkbox"/>
Maximum class size .....		20 or lower	<input checked="" type="checkbox"/>
3-year-olds .....	NA		
4-year-olds .....	18		
Staff-child ratio .....		1:10 or better	<input checked="" type="checkbox"/>
3-year-olds .....	NA		
4-year-olds .....	1:9		
Screening/referral and support services .....	Vision; hearing; height/weight; blood pressure; immunizations; psychosocial/behavioral; dental; developmental; full physical exam; and support services	Vision, hearing, health; and at least 1 support service	<input checked="" type="checkbox"/>
Meals .....	Lunch and either breakfast or snack	At least 1/day	<input checked="" type="checkbox"/>
Monitoring .....	Site visits and other monitoring	Site visits	<input checked="" type="checkbox"/>

**TOTAL BENCHMARKS MET**

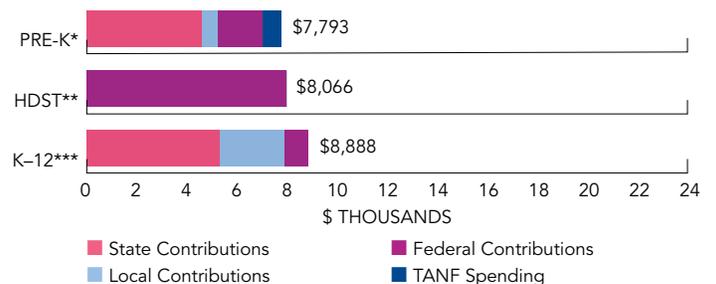
10

### RESOURCES

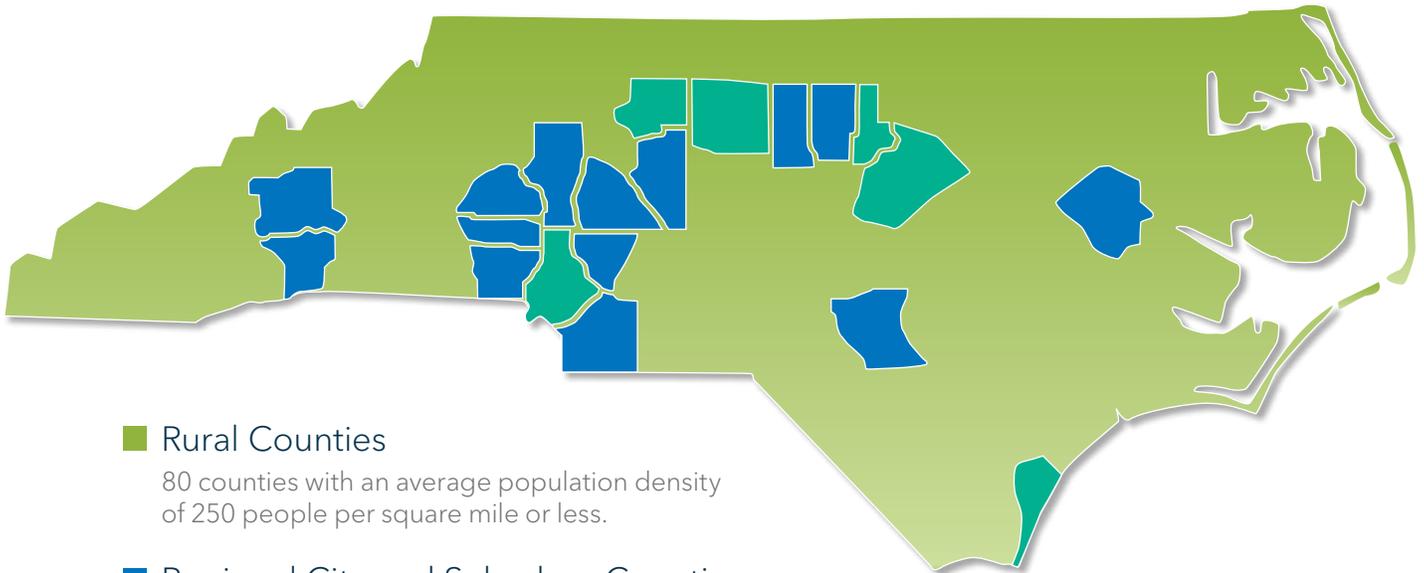
Total state pre-K spending .....	\$143,385,799
Local match required? .....	Yes
State spending per child enrolled .....	\$5,340
All reported spending per child enrolled* .....	\$7,793

\* Pre-K programs may receive additional funds from federal or local sources that are not included in this figure.  
 \*\* Head Start per-child spending for the 2014-2015 year includes funding only for 3- and 4-year-olds served. Past years' figures have unintentionally included funds for Early Head Start.  
 \*\*\* K-12 expenditures include capital spending as well as current operating expenditures. Data are for the '14-'15 school year, unless otherwise noted.

SPENDING PER CHILD ENROLLED



## Population Density of North Carolina Counties



### ■ Rural Counties

80 counties with an average population density of 250 people per square mile or less.

### ■ Regional City and Suburban Counties

14 counties with an average population density between 250 and 750 people per square mile.

### ■ Urban Counties

6 counties with an average population density that exceeds 750 people per square mile.

## Brookings Report Contributing Scientists

BROOKINGS



UCI University of California, Irvine



GEORGETOWN UNIVERSITY

THE UNIVERSITY OF CHICAGO



VANDERBILT UNIVERSITY®



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