

# **LA 4 Longitudinal Study: The Impact of LA 4 Participation on Academic Achievement in 3rd & 4th Grade: iLEAP & LEAP Performance for Cohorts 1-4**

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## Executive Summary

This report from the LA 4 Longitudinal Study presents new data about the academic performance of children in Cohort 3 (N=2,427) and Cohort 4 (N=4,147) who participated in the LA 4 program to improve school preparedness and later school achievement, compared to children who entered kindergarten in the same schools but had no public PreK. Results indicate that low-income children (identified by Free or Reduced Meal Services status) who received LA 4 (> 80% of the LA 4 students) had significantly elevated rates of achieving “Basic or above” on all subjects areas assessed by the 3<sup>rd</sup> grade *i*LEAP and 4<sup>th</sup> grade LEAP. The pattern of results for the most recent cohorts is essentially the same as that reported earlier for Cohorts 1 and 2.

### KEY FINDINGS:

- In 3<sup>rd</sup> grade, 73% of the LA 4 students in Cohorts 3 and 4 met “Basic or above” on *i*LEAP for English Language Arts compared to 60% for peers who received no public PreK. On *i*LEAP Math, 70% of the LA 4 group met this standard compared to 60% for the no public PreK group.
- In 4<sup>th</sup> grade, 75% of the Cohort 3 LA 4 children met “Basic or above” on LEAP for English Language Arts compared to 66% for the no public PreK group. On LEAP Math, 76% of the LA 4 group met this standard compared to 66% for the no public PreK group.
- LA 4 produced significant lasting benefits for both boys and girls and Blacks and Whites. The subgroups that benefited the most were boys and Blacks.
- LA 4 children’s performance is higher than the Louisiana state average on both *i*LEAP and LEAP.
- For the small proportion of children in LA 4 who do not receive Free or Reduced Meal Services, participation in LA 4 had no measurable impact on 3<sup>rd</sup> grade *i*LEAP and 4<sup>th</sup> grade LEAP performance. (Note: Higher income children performed at higher levels than did lower income children.)

### KEY POLICY IMPLICATIONS:

LA 4 has produced a consistent pattern of significant benefits for children from low-income families for four successive cohorts. These benefits extend through 4<sup>th</sup> grade (the highest grade for which data are available).

- The evidence provides strong support for continuing support and expansion of LA 4 (and other PreK programs that meet or exceed the standards and quality of LA 4) as a highly effective investment to improve the academic performance of low-income children.
- Because LA 4 demonstrates significant benefits for boys and girls and Blacks and Whites show large benefits, LA 4 can be considered a “proven strategy” to raise the performance of multiple at-risk groups.
- Since achievement levels in 3<sup>rd</sup> and 4<sup>th</sup> grade are highly predictive of later academic performance and high school completion, LA 4 participants are expected to continue to perform at significantly higher levels than peers who did not have a full year of high quality PreK.
- Despite these positive outcomes, the performance of low-income LA 4 children still is below that of children from more economically advantaged families, suggesting that a one-year program may not suffice to completely overcome the income achievement gap (although the magnitude of gap reduction is about 50%). Accordingly, starting earlier to provide strong educational supports for low-income children may produce even greater lasting benefits.

## Introduction

This report presents new findings about the impact of participating in the LA 4 program for the first four cohorts of students – Cohort 1 (2002–03), Cohort 2 (2003–04), Cohort 3 (2004–05), and Cohort 4 (2005–06) in terms of achievement scores on the statewide standardized assessments administered to all public school students in the spring of third grade (iLEAP) and fourth grade (LEAP). Data now available for Cohort 3 include performance on both third and fourth grade assessments, while for Cohort 4, new data include third grade performance (fourth grade results are anticipated to become available in late summer 2011).

## The LA 4 Program: A Brief History

The LA 4 program represents a strategic investment in early childhood education to promote school readiness and later school achievement of children from low-income families. The Louisiana state legislature passed Senate Bill 776 in 2001, creating the first statewide voluntary public PreK program, known as LA 4. This program provides 4-year-old children a high quality early childhood education guided by statewide standards and an evidence-based curriculum. From the start, LA 4 has been monitored annually for quality and student performance. Results of this monitoring and longitudinal assessment of LA 4 children are reported regularly to the state Department of Education and state Board. Previous reports indicate that LA 4 classrooms are consistently rated as above national average as indexed by the Early Childhood Environment Rating Scale (ECERS-R). Further, each cohort of LA 4 children has demonstrated large, statistically significant increases in their performance from fall to spring of their PreK year on The Developmental Skills Checklist (DSC) that assesses language, print awareness, and math skills. Table 1 summarizes the number of children enrolled in the LA 4 Longitudinal Study since the program began. Enrollment criteria were: having an intake form (demographic and family data), fall and spring assessment on the DSC, and enrolling in a public school kindergarten the year after participating in LA 4.

**Table 1. Expected Progression of LA 4 Longitudinal Study Cohort children from PreK through 8th Grade**

	LA 4 PreK	K	1 <sup>st</sup> Grade	2 <sup>nd</sup> Grade	3 <sup>rd</sup> Grade	4 <sup>th</sup> Grade	5 <sup>th</sup> Grade	6 <sup>th</sup> Grade	7 <sup>th</sup> Grade	8 <sup>th</sup> Grade
<sup>1</sup> Pilot N = 1,358	Jan. 2002	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Cohort 1 N = 3,711	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	
Cohort 2 N = 4,767	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11		
Cohort 3 N = 4,665	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11			
Cohort 4 N = 8,974	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11				
Cohort 5 N = 8,557	2006–07	2007–08	2008–09	2009–10	2010–11					
Cohort 6 N = 9,787	2007–08	2008–09	2009–10	2010–11						
Cohort 7 N = 12,629	2008–09	2009–10	2010–11							
Cohort 8 N = 13,388	2009–10	2010–11								
Cohort 9 N=TBD	2010–11									

The cohorts included in this longitudinal report.

Source: The Picard Center Longitudinal Data Set

<sup>1</sup> The first year of LA4 was begun in January of 2002. This comprises the “Pilot” cohort of children who received only a half year of the program.



## The LA 4 Longitudinal Study

The Cecil J. Picard Center for Child Development and Lifelong Learning at the University of Louisiana at Lafayette conducts the evaluation and research on the LA 4 program for LDOE. The LA 4 Longitudinal Study focuses on the school progress of children who participated in LA 4 (from fall to spring) and then entered kindergarten in a Louisiana public school the following school year. The progress of the LA 4 children is compared to a cohort of all peers who entered kindergarten in the same public schools in the same year as the LA 4 children, but had no record of receiving any public PreK program. This comparison group is labeled the No Public Pre-K (NPPK) group. The LA 4 Longitudinal Study obtains the following data about school performance: on-time promotion to the next grade level, special education placement, and performance on statewide standardized assessments of academic achievement. The 3<sup>rd</sup> iLEAP and 4<sup>th</sup> grade LEAP performance data are considered in terms of (a) percentage who score at the “Basic Level” of achievement or above and (b) mean scores and standard deviations. (Note: because both ways of considering performance data reveal the same results, only the “Basic or above” results are included in the text. The standardized scores with statistical analyses are included in the Technical Report accompanying this report.) Future data collection will include 8<sup>th</sup> grade standardized achievement tests (the last age at which all children are required to be attending school), high school graduation rates (both on-time and completion rates), entry into and completion of college and vocational education and training programs, and adult employment.

This report presents new findings that answer the following questions:

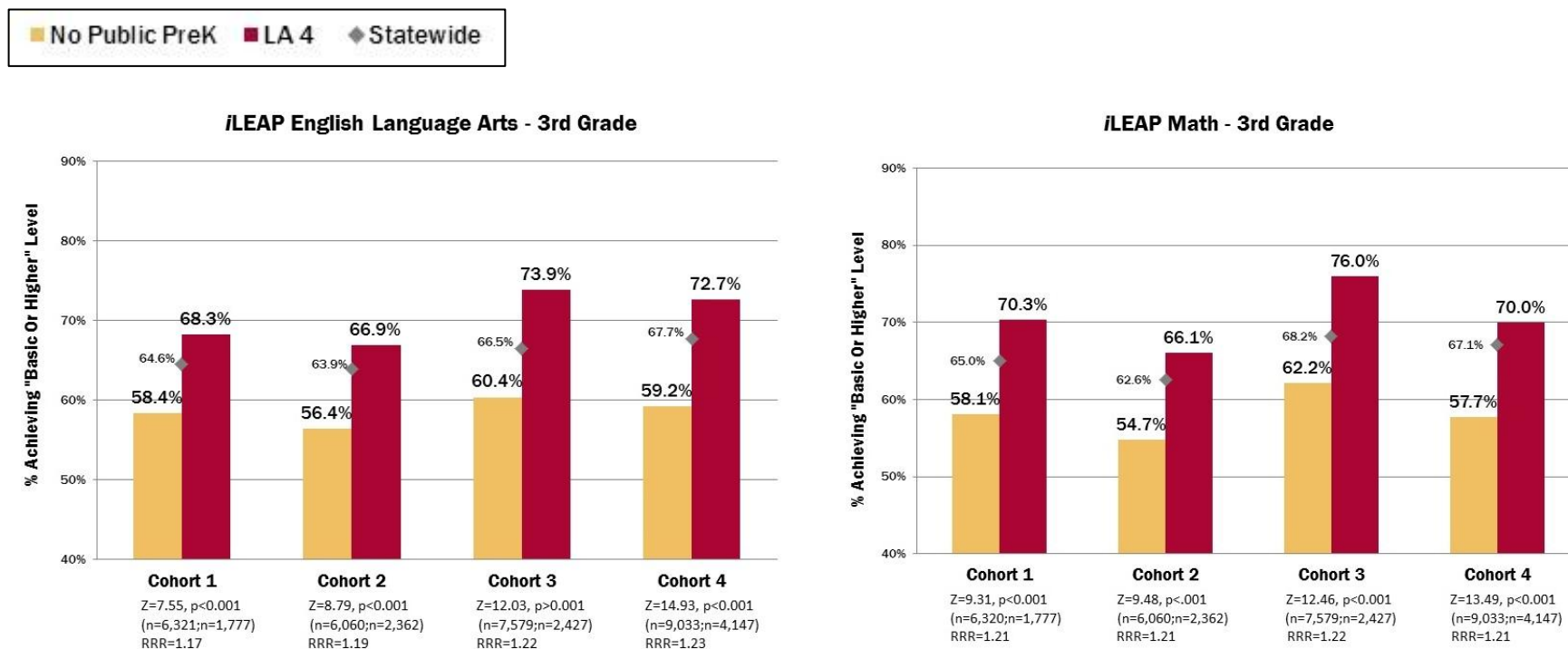
- How do low-income students in LA 4 Cohorts 3 and 4 perform on iLEAP (3<sup>rd</sup> grade) compared to peers who did not receive any public PreK? How does their performance compare to earlier LA 4 cohorts?
- How do low-income students in LA 4 Cohort 3 perform on LEAP (4<sup>th</sup> grade) compared to the no public PreK group? How does their performance compare to earlier LA 4 cohorts?
- If the new findings from Cohorts 3 and 4 support earlier reports that LA 4 leads to significant improvements in academic performance, then do subgroup analyses show these benefits occur for both boys and girls? Blacks and Whites? and children from higher income families?

## Findings

### Performance in the spring of 3<sup>rd</sup> grade on the *i*LEAP

Figure 1 shows the performance of the first 4 cohorts of LA 4 and the Non-Public Pre-K (NPPK) children who received free and reduced meal services (FRL) in kindergarten. (Note: Children receiving FRL represent 82 -88% of each LA 4 cohort.). For all four cohorts, the LA 4 children performed at significantly higher levels than did the NPPK children. The new data for Cohorts 3 and 4 show the LA 4 group had rates of achieving “Basic or above” that averaged 13.5% higher on English Language Arts, 15.6% higher on Math, 11.2% higher in Science, and 10.7% higher on Social Studies compared to NPPK peers (effect sizes: 1.18 to 1.23 relative risk ratios). Cohorts 3 and 4 show the same pattern of results as reported earlier for Cohorts 1 and 2. As Figure 1 shows, low-income children in the LA 4 group perform even higher than the statewide levels for each of the cohorts. (Note: The statewide level includes children from all income groups.)

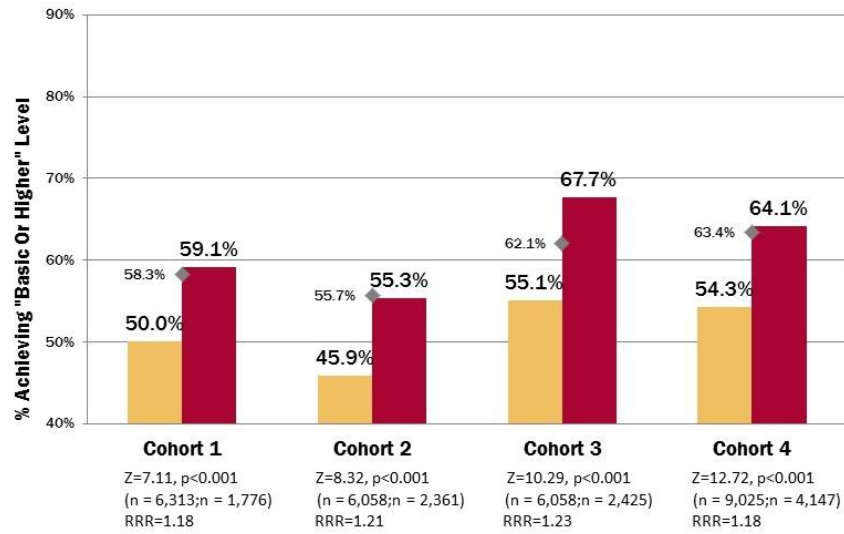
**Figure 1. *i*LEAP Performance LA 4 and NPPK Groups**



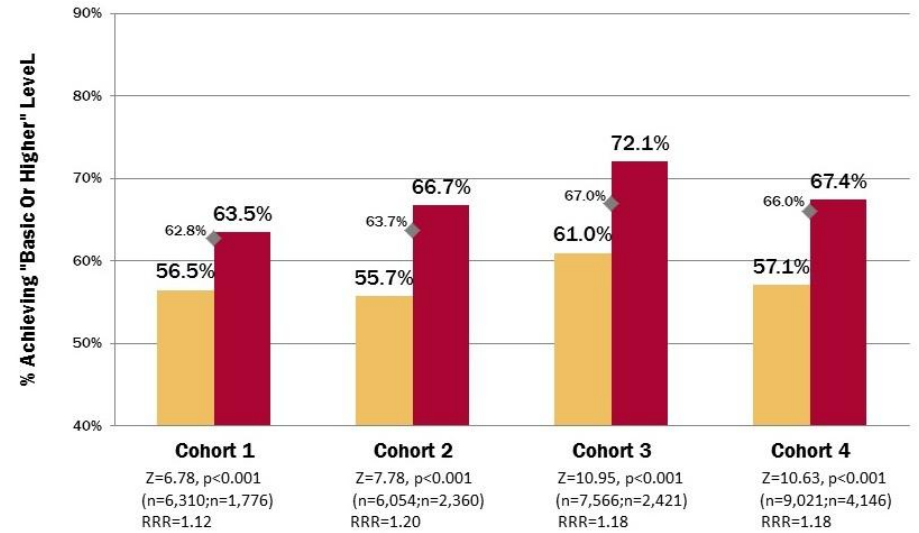
Source: Picard Center Integrated Longitudinal Data System



**iLEAP Science - 3rd Grade**



**iLEAP Social Studies - 3rd Grade**

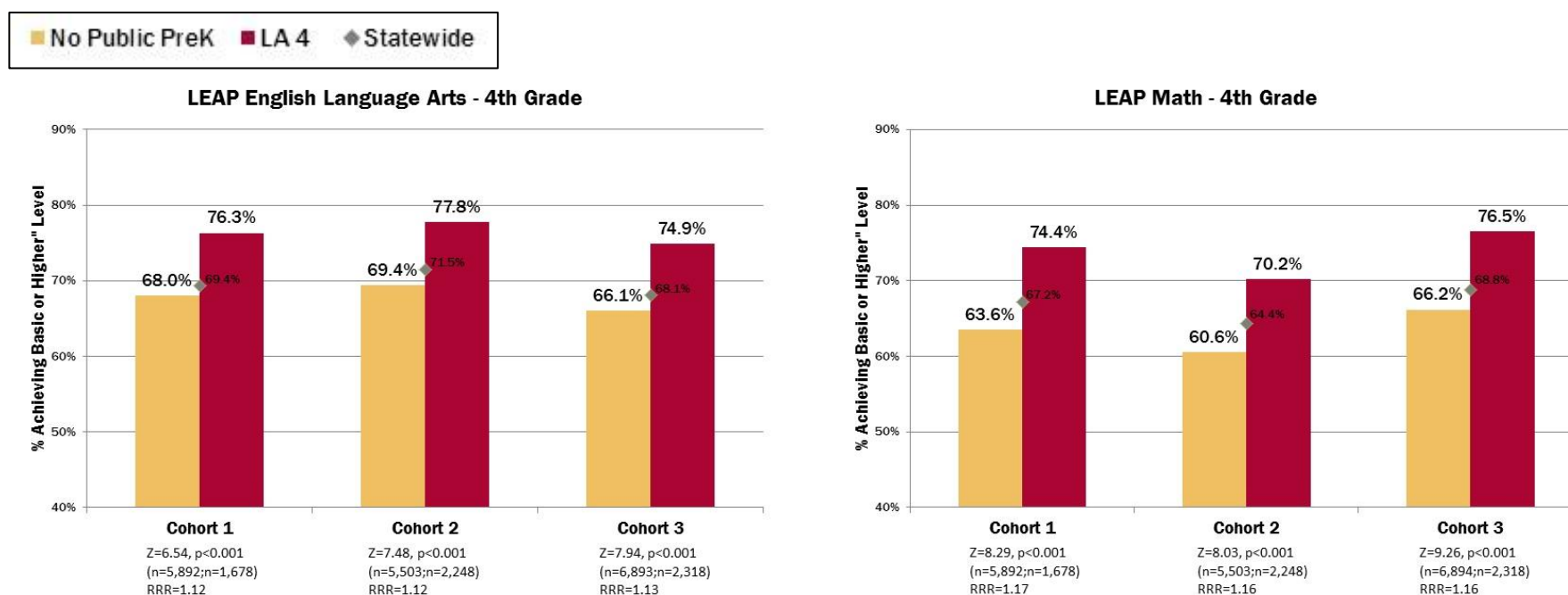


Source: Picard Center Integrated Longitudinal Data System

## Performance on LEAP in the spring of 4<sup>th</sup> grade

Figure 2 presents performance data for the first 3 cohorts on the LEAP, the state's first "high stakes" assessment, requiring children to achieve "Basic or above" for recommended advancement to the next grade level. In all four subject areas, a significantly greater percentage of children in the LA 4 group achieved this statewide standard compared to children in the NPPK group. The children in the LA 4 Cohort 3 had rates of achieving "Basic or above" that were 8.9% higher on English Language Arts, 10.3% higher on Math, 9.1% higher in Science, and 8.6% higher on Social Studies compared to NPPK peers (effect sizes: 1.13 - 1.16 relative risk ratios). Group differences for Cohort 3 are essentially the same as those reported earlier for Cohorts 1 and 2. Further, the LA 4 group shows rates of "Basic or above" that exceed the statewide standard (shown for each cohort in Figure 2).

**Figure 2. LEAP Performance LA 4 and NPPK Groups**

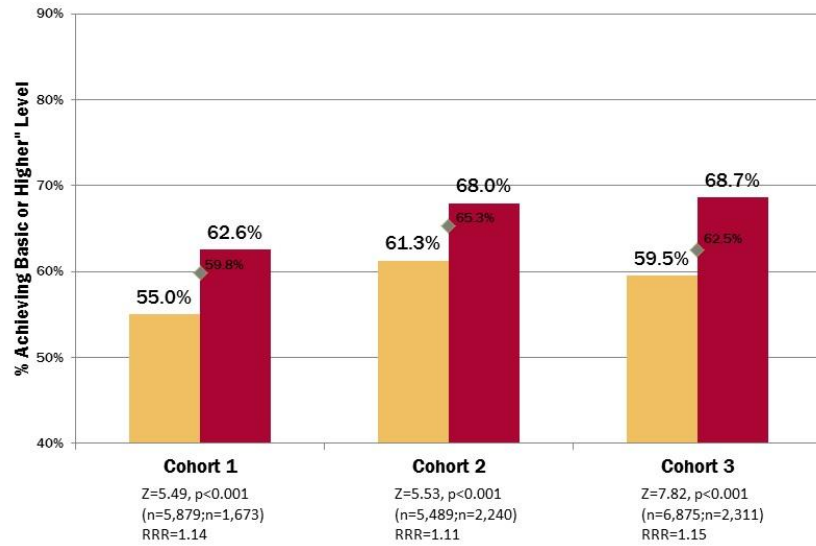


Source: Picard Center Integrated Longitudinal Data System

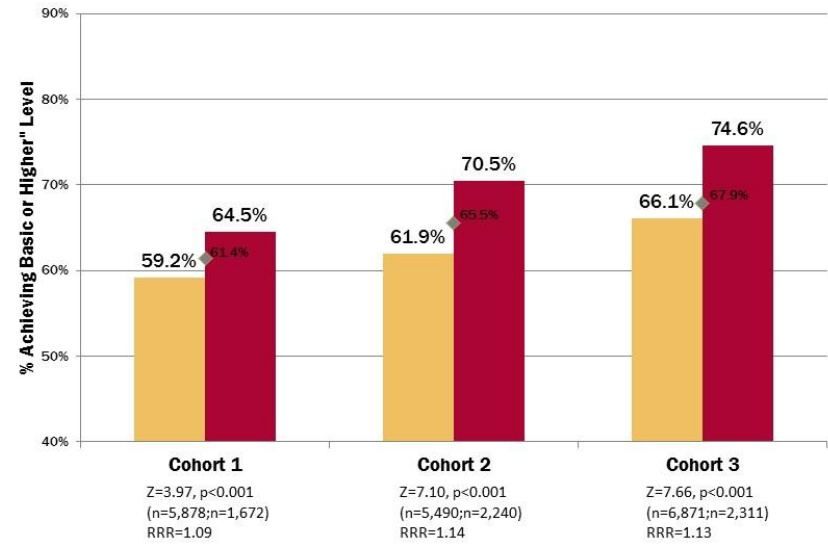




**LEAP Science - 4th Grade**



**LEAP Social Studies - 4th Grade**

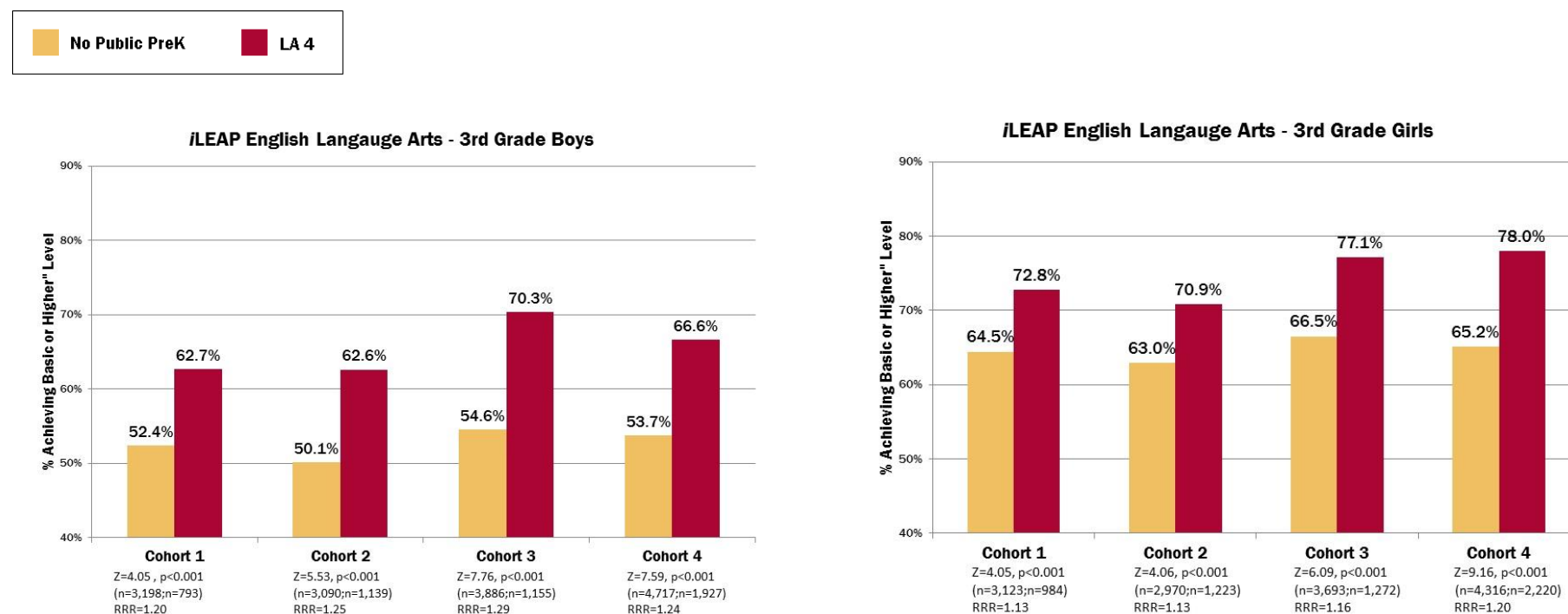


Source: Picard Center Integrated Longitudinal Data System

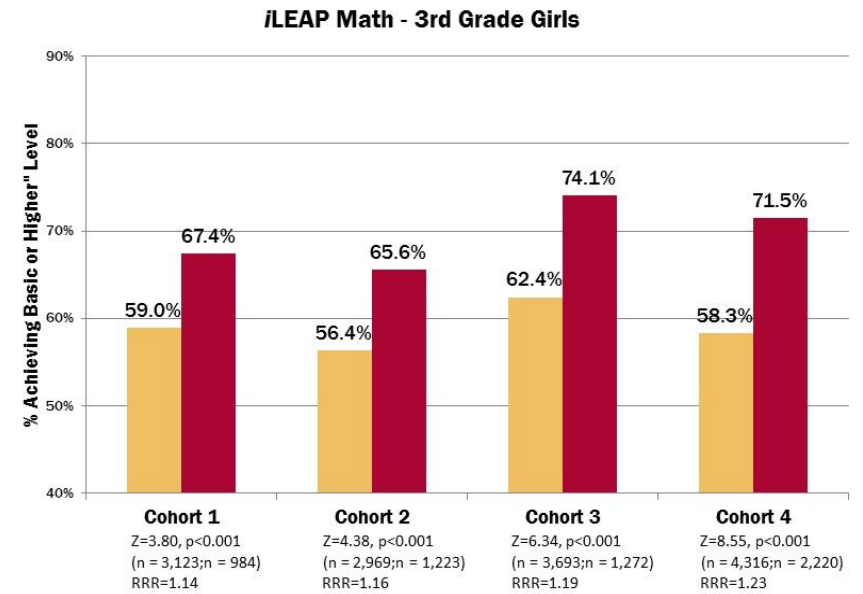
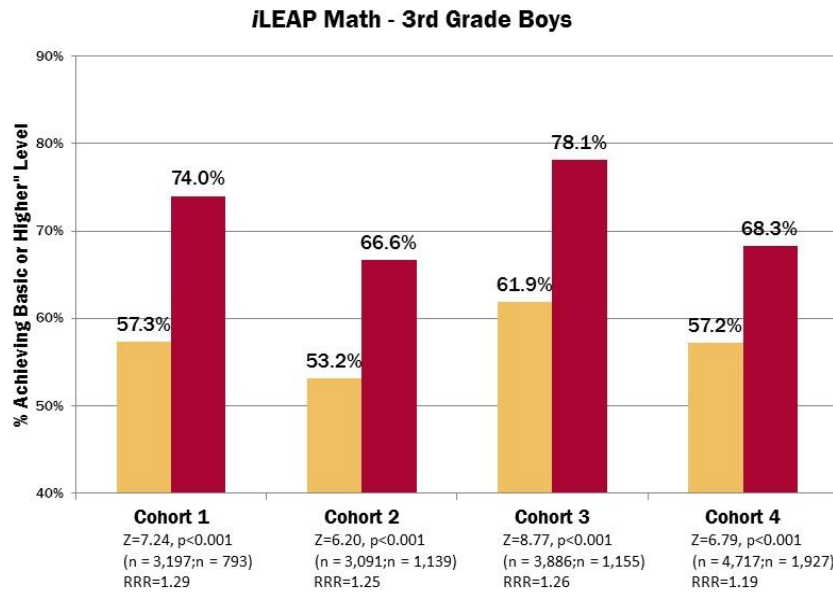
### Subgroup differences: A. Boy and Girls

Figure 3 illustrates performance of girls and boys in the LA 4 and NPPK groups on the English Language Arts and Math components of the 3<sup>rd</sup> grade *i*LEAP. Both boys and girls who participated in LA 4 benefitted significantly: in English Language Arts, LA 4 boys had a mean of 65.5% (across four cohorts) who met the “Basic or above” standard compared to 52.7% for the NPPK boys, while LA 4 girls had a mean rate of 74.7% compared to 64.8% for the NPPK girls. Math performance showed this same pattern of benefits: LA 4 boys had mean rates of 71.8% compared to 57.4% for NPPK boys; LA 4 girls averaged 69.6% compared to 59.02% for NPPK girls. (See the Technical Report for a full listing of all *i*LEAP subject areas for both genders.)

Figure 3. *i*LEAP Performance for Boys and Girls



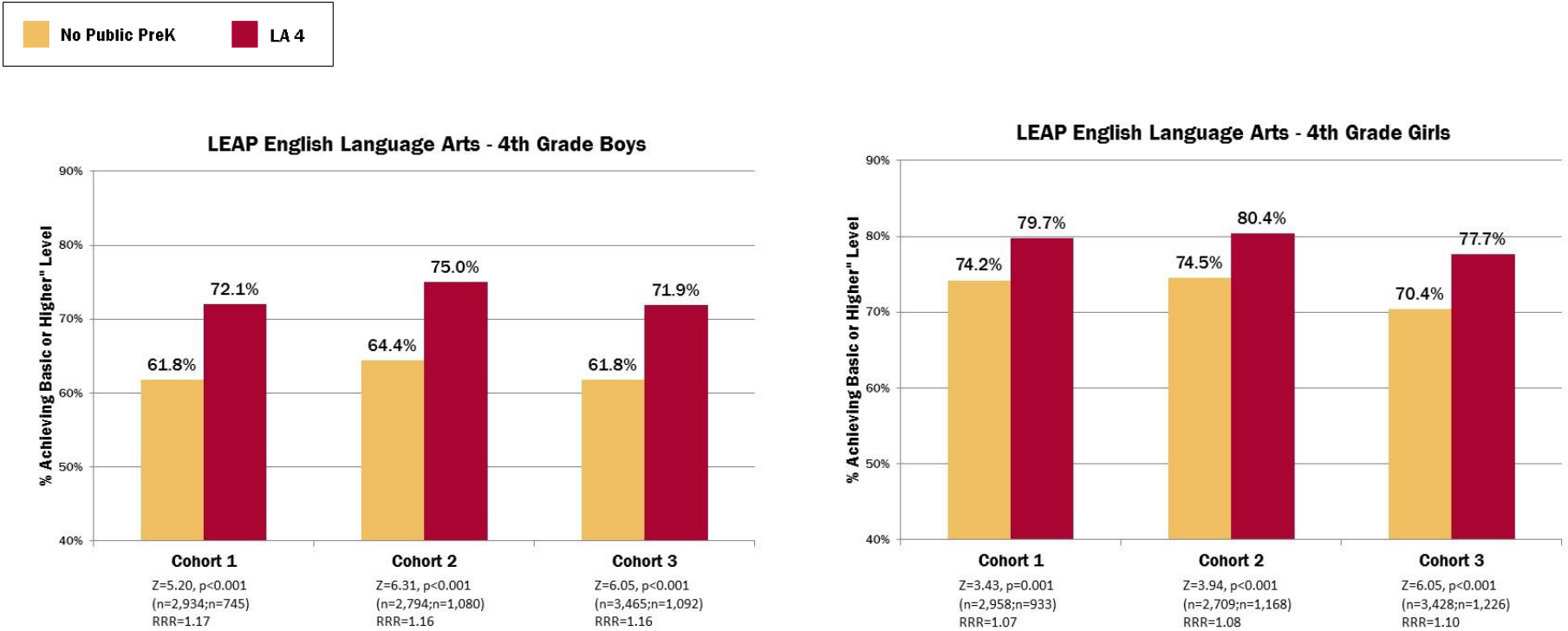
Source: Picard Center Integrated Longitudinal Data System



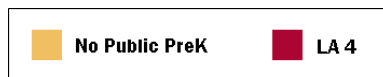
Source: Picard Center Integrated Longitudinal Data System

Figure 4 displays performance of boys and girls on 4th grade LEAP for English Language Arts and Math. The pattern again affirms significant sustained benefits associated with LA 4 participation for boy and girls, with effect sizes averaging 1.16 for boys and 1.13 for girls.

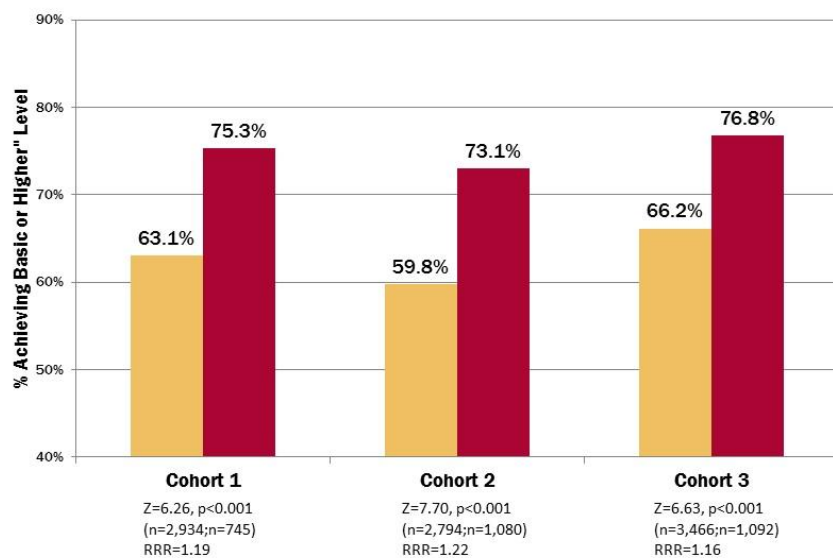
Figure 4. LEAP Performance for Boys and Girls



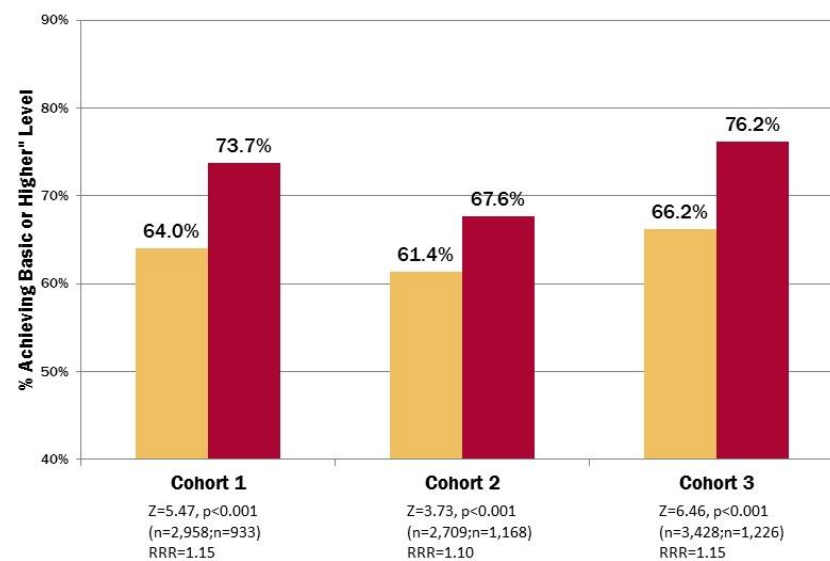
Source: Picard Center Integrated Longitudinal Data System



**LEAP Math- 4th Grade Boys**



**LEAP Math- 4th Grade Girls**



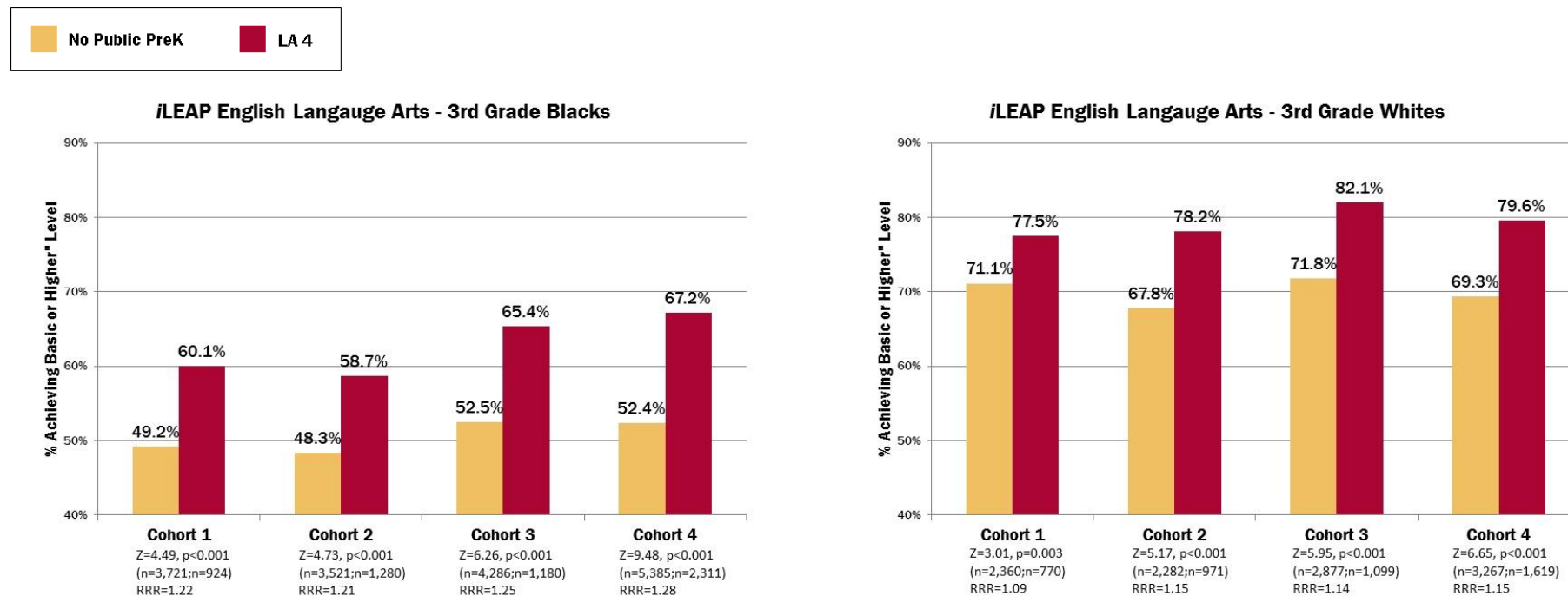
Source: Picard Center Integrated Longitudinal Data System



### Subgroup Analyses: B. Black and White Students

Figure 5 displays the performance of children who are Black and White. Performance on both English Language Arts and Math *i*LEAP scores was significantly elevated for both racial groups when they received LA 4: Blacks who received LA 4 had mean rates of “Basic or above” of 65.3% and 61.5% respectively, compared to NPPK peers with rates of 50.6% and 48.1% (effect sizes: 1.21 - 1.30). Similarly, the LA 4 White children had mean rates of “Basic or above” of 79.4% compared to 70.0% for the NPPK on English Language Arts; and 81.5% versus 72.5% for NPPK on Math (effect sizes: 1.09 - 1.16).

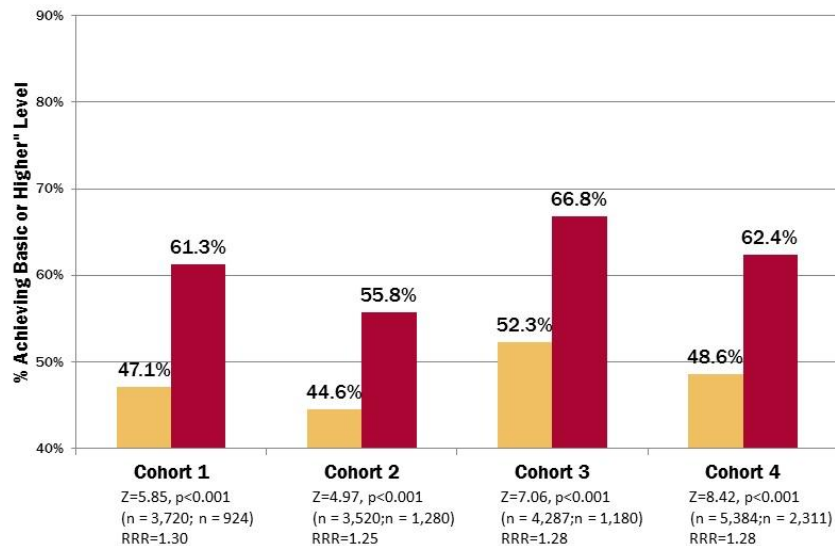
**Figure 5. *i*LEAP Performance for Blacks and Whites**



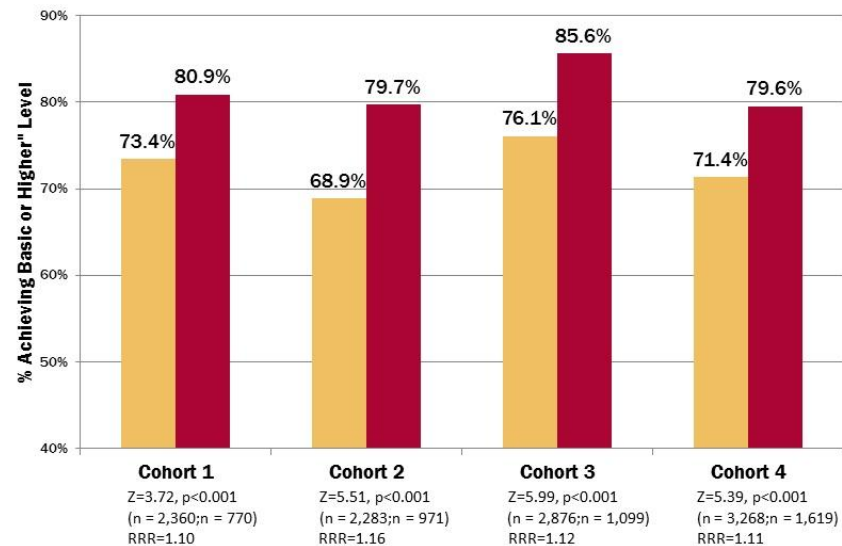
Source: Picard Center Integrated Longitudinal Data System



**iLEAP Math - 3rd Grade Blacks**



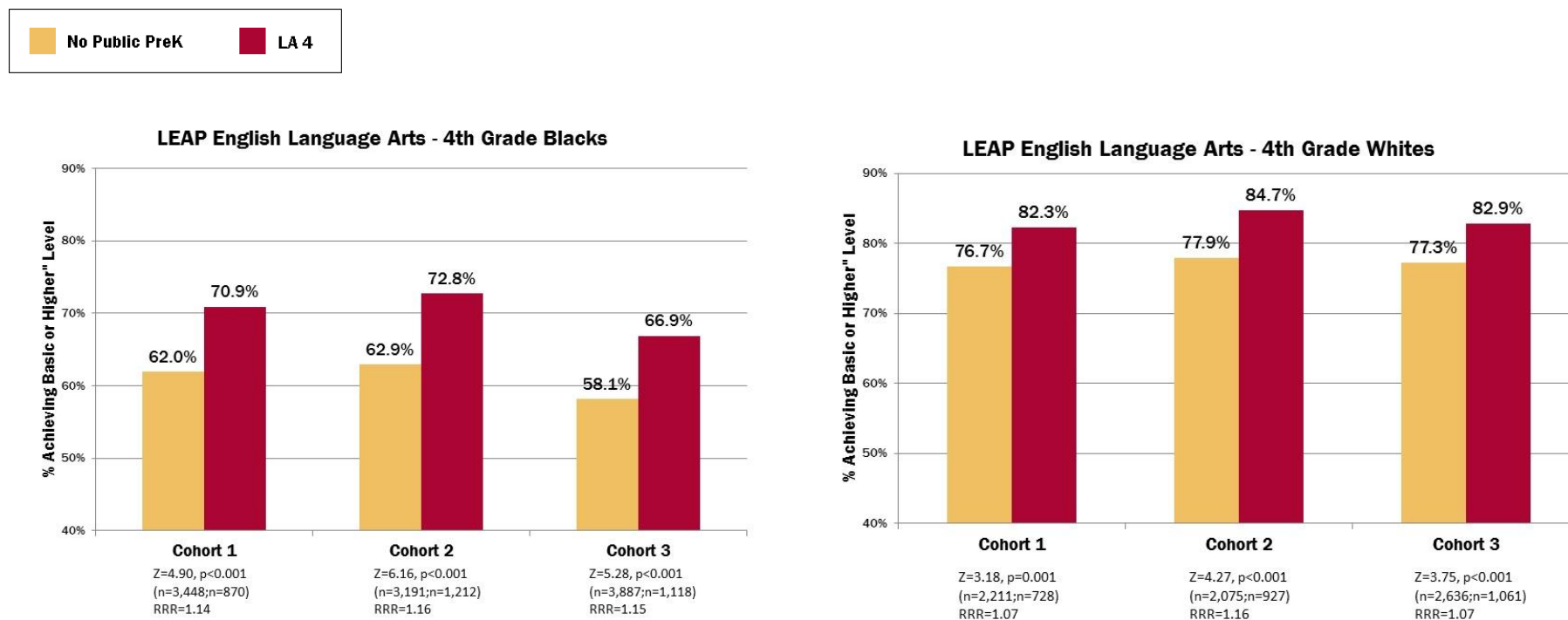
**iLEAP Math - 3rd Grade Whites**



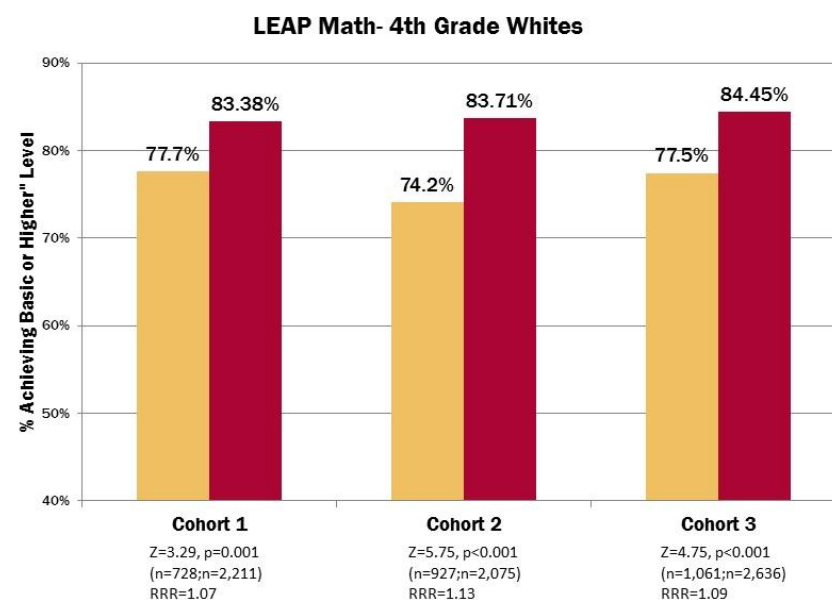
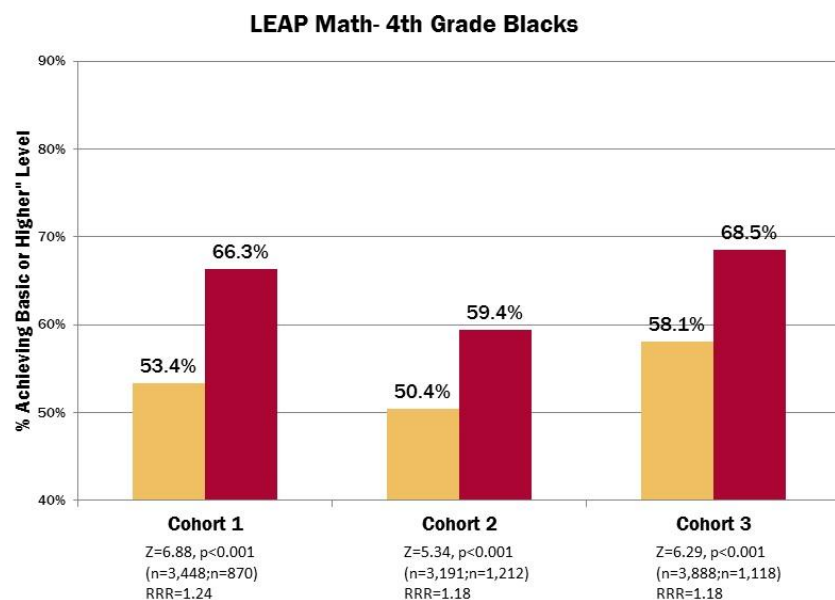
Source: Picard Center Integrated Longitudinal Data System

This pattern of significant benefits for both boys and girls and for Blacks and Whites also appears a year later when children take the LEAP in the spring of 4<sup>th</sup> grade. Figure 6 displays these subgroup effects for Cohorts 1, 2, and 3. The Technical Report includes all findings related to Science and Social Studies as well, which affirm the same pattern and magnitude of benefits of LA 4 participation on all subgroups.

**Figure 6. LEAP Performance for Blacks and Whites**



Source: Picard Center Integrated Longitudinal Data System



Source: Picard Center Integrated Longitudinal Data System

## **Comparison of Non-Free and Reduced Meal**

### **Services (Non-FRMS) students in LA 4 and NPPK groups**

Data included in the Technical Report affirm earlier cohort findings that participation in LA 4 does not produce consistent, significant benefits for children who do not receive FRMS (i.e., children from higher income families). The Non-FRMS children comprise less than 20% of those who participated in LA 4. Unfortunately, no information is available about whether children in the NPPK group received private preschool or child development programs that might have been comparable to the LA 4 program. As expected, based on extensive prior findings in Louisiana and nationwide, children in the non-FRMS group performed at higher levels than children who received FRMS. A direct comparison of the rates of achieving “basic or above” for children in the non-FRMS and those in FRMS groups indicates that, on average, participating in LA 4 raises the performance level of low-income (FRMS) children to be about mid-way between the low-income children who received no public PreK and the higher-income (non-FRMS) group. Thus, LA 4 serves to produce progress toward “closing the income performance gap,” but it does not totally eliminate this difference.

## **Summary of Key Findings and Policy Implications**

### **MAJOR FINDINGS:**

- **LA 4 continues to produce significant benefits for children from low-income families (they comprise the vast majority enrolled in the LA 4 program) in the spring of both 3<sup>rd</sup> and 4<sup>th</sup> grades.** This affirms that as the statewide LA 4 program has expanded to serve larger numbers of children in more school districts, it has maintained high quality and produced evidence of sustainable benefits up to 5 years after children public school. The LA 4 children perform better in all subjects – English Language Arts, Math, Science, and Social Studies. The effect sizes are in the moderate range for these longer term outcomes.
- **The long-term benefits associated with LA 4 program participation extend to both boys and girls and Black and White students.** The findings in this report also show that boys and Blacks are the subgroups that benefit the most.

### **POLICY IMPLICATIONS:**

- **Provision of a high quality PreK program, such as LA 4, for children from low-income families is an effective strategy to drive up academic achievement of these at-risk children in both 3<sup>rd</sup> and 4<sup>th</sup> grades.** Coupled with the earlier reports that significantly higher percentages of children in the LA 4 group have on-time arrival in 4<sup>th</sup> grade rates that averaged 8.5% higher for the first 4 cohorts than for children in the NPPK group (mean rate = 73.6%, very close to the state’s goal of 75%) and that LA 4 children have significantly lower rates of special education placement by first grade - LA 4 a mean 9% special education placement rate compared to 14% for children in the NPPK group - these findings support the prediction that LA 4 children will continue to perform better and have higher rates of high school completion.
- **Because the LA 4 program does not entirely close the income achievement gap, strategies to continue to improve the performance of low-income children need to consider the value of earlier educational supports (from birth through age 4) as well as the use of individualized supports when they enter public school.** Research findings from elsewhere indicate that a comprehensive system of early childhood supports for learning and health promotion might produce even larger gains than from a high quality, only one-year program for 4-year-olds. Parents with greater financial resources have been able, on



average, to prepare their children well for later school success through a variety of routes, including obtaining private PreK and providing strong home- and community-based activities that have educational value. From recent findings in Louisiana when an Early Reading First program initiative was launched, it appears that LA 4 plus Early Reading First in the first few years in school produces literacy benefits that are significantly greater than participating in only one of these programs.

- **These findings raise interesting questions that warrant additional analyses to answer questions about whether LA 4 programs in all parishes produce comparable magnitude benefits?** If there is substantial variation, then what are the factors associated with LA 4 programs that have the largest benefits compared to those that have smaller magnitude benefits? To what extent does variation in benefits appear to relate to the LA 4 program quality, the quality of the schools children attend, or other factors? Based on discussion after a preliminary review of the findings in this report, a plan for future analyses will be developed.