PGCPS Prince George's County Public Schools

Great By Choice

EVALUATION REPORT

Trends in School Readiness and the Effect of PGCPS Prekindergarten Participation, 2015 through 2017

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EXECUTIVE SUMMARY

Having expressed the singular goal of Prince George's County Public Schools (PGCPS)–"Outstanding Academic Achievement for All Students"–begins with ensuring all students enter school ready to learn, district leaders and early childhood program officers were curious to know how well incoming kindergarteners had been prepared for school and whether participation in a PGPCS prekindergarten (pre-K) program impacted school readiness. Within this context we developed the following research questions:

1. *What is the trend of school readiness among first-time kindergarten entrants in PGCPS from SY2015 through SY2017?*
2. *To what extent does school readiness vary across different demographic groups?*
3. *To what extent does participation in different PGCPS pre-K programs impact school readiness for first-time kindergarten entrants?*

The data needed to complete this study were obtained from testing results available from the Department of Testing, Research, and Evaluation (DTRE) and the Office of Early Childhood Education. Enrollment data for the years considered in this study were provided by the Information Technology (IT) department. Specifically, we utilized Kindergarten Readiness Assessment (KRA) results from SY2015 through SY2017 and pre-K and Head start enrollment files from SY2014 through SY2016.

To address the first research question, we used descriptive statistics to report the changes in school readiness over the three cohorts of first-time kindergarten entrants included in this study. The second research question was answered by disaggregating the school readiness measures for selected socio-demographic subgroups. To answer the third research question, we used the potential-outcomes estimation framework of the Average Treatment Effect (ATE) model, a quasi-experimental research design, to determine the impact of PGCPS pre-K program participation on school readiness.

School Readiness, SY2015 to SY2017

The findings showed that readiness for school among kindergarteners was higher in SY2016 compared with the previous baseline year. In SY2016 the district school readiness rate increased to 38.3% from 34.4%, a growth of 3.9 percentage points. In SY2017, however, the district school readiness rate decreased to 34.3%, a decline of 4 percentage points. Compared to the baseline year of 2015, the percentage of school-ready students in 2017 is the same as 2015.

The findings also show that there are persistent gaps in school readiness among different socio-demographic groups. Male kindergarteners demonstrate lower rates of readiness in comparison to their female peers. Incoming kindergarteners who are Hispanic, English Language Learners (ELLs), come from poor families, or require special education services start school less prepared than students without those socio-demographic characteristics.

Prekindergarten experiences and Kindergarten Readiness, SY2015 to SY2017

The findings from the treatment effect analysis suggest that participation in a PGCPS pre-K program would result in higher school readiness rates relative to non-participation in any PGCPS pre-K program. The program effect of participating in PGCPS pre-K on school readiness was 9.8, 12.1, and 16.4 percentage points, for the SY2015, SY2016, and SY2017 cohorts of incoming kindergarteners, respectively. For example, the SY2015 kindergarten cohort had a school-readiness rate of 34.4%; the model suggests that had the non-participants also been enrolled in a PGCPS pre-K program for the school year immediately preceding kindergarten entry, the SY2015 readiness rate would have been 39%. Had all of the SY2016 incoming kindergarteners been enrolled in a PGCPS pre-K program, the percentage of PGCPS kindergarteners demonstrating school readiness would have been 44%; for SY2017 the readiness rate would have been 41.4%. Comparatively, the school-readiness rate among incoming kindergarteners across the state of Maryland was 47% for SY2015, 45% for SY2016, and 43% for SY2017. Thus, universal participation in a PGCPS pre-K program among PGCPS first-time kindergarteners would have resulted in their demonstrating readiness for school close to the state average for SY2016 and SY2017. Alternatively, if none of the students in the kindergarten cohorts had attended pre-K in PGCPS the percent demonstrating readiness would have been 29.2, 31.8, and 24.7 for SY2015, SY2016 and SY2017, respectively. Therefore, we conclude that PGCPS pre-K programs do a better job of preparing children for school than other pre-K settings experienced by incoming PGCPS kindergarteners.

The findings further suggests that participating PGCPS full-day pre-K or Head Start programs results in a higher school-readiness rate when compared to participating in PGCPS half-day pre-K program. Specifically, we estimate that the school-readiness rate among incoming PGCPS kindergarteners who attended PGCPS pre-K programs would be higher by 6 to 7 percentage points had all students participated in full-day pre-K or Head Start programs relative to participating in the half-day pre-K program. The conclusion, therefore, is that PGCPS full-day pre-K and Head Start programs are better than half-day programs at preparing children for school.

Recommendations

Determine the lasting effect of PGCPS pre-K education. Even though we determined that participation in a PGCPS pre-K program is associated with an increase in the school-readiness rate, it may be that kindergarten helps the not-yet-ready students to catch-up with their *already-ready* peers so that they are comparably prepared for first grade. Therefore, we recommend that we continue to follow these cohorts of kindergarten entrants over the first few years of elementary school in order to study and analyze their academic performance and its relationship, if any, to their pre-K preparation.

Conduct an analysis to determine the size of the investment necessary to increase the school-readiness rates. Using budget data and other sources of cost data, we could estimate the financial costs associated with meeting the district's school-readiness rate goals. It is only when we have a complete picture of the costs needed to realize the sought-after benefit that sound policy decisions about expansion of early childhood education can be made.

I. INTRODUCTION

As described in the Prince George's County Public Schools (PGCPS) Strategic Plan, 2016–2020, the pathway to the singular goal of PGCPS–"Outstanding Academic Achievement for All Students"–begins with ensuring all students enter school ready to learn. To this end, the Maryland State Department of Education (MSDE) developed a framework for school readiness. In order to align the school-readiness assessment with the common core standards, MSDE introduced the new Kindergarten Readiness Assessment (KRA) in 2014. The KRA is a tool that allows teachers to measure each child's school readiness across four domains: Social Foundations, Mathematics, Language and Literacy, and Physical Well-being and Motor Development. Teachers administer the KRA to all children in kindergarten between the first day of school and November 1. Scores are then calculated for each domain and for overall performance. The overall score determines performance levels of Demonstrating Readiness, Approaching Readiness and Emerging Readiness.

A. Scope and Purpose of the Research

Children enter kindergarten having potentially experienced a variety of early childhood care and education settings. Many attend prekindergarten[1] (pre-K) programs within PGCPS, which are either full- or half-day, or a non-PGCPS pre-K program with a formal educational component. Others participate in Head Start programs, which also have an educational component. Still others are cared for in informal settings, such as their own home or a relative's home, and do not have exposure to a formal schooling environment until they enter kindergarten.

PGCPS prekindergarten is a preschool program for four-year-old students whose families are economically disadvantaged and meet income-eligibility requirements, or are homeless, or have an Individualized Education Plan (IEP). The program is designed to provide students with a variety of learning experiences that address their cognitive, social, emotional, and physical needs. The PGCPS pre-K program is primarily a boundary-based program, meaning that students are assigned to prekindergarten sites based on where they live. PGCPS pre-K sites are located in district elementary schools throughout the county.

Over the past three years, PGCPS has been expanding access to prekindergarten education by increasing the number of schools offering pre-K services. Furthermore, the district has been expanding the intensity of the program as well, by replacing half-day programs with full-day programs. Due to the significant financial investment this expansion represents, district leaders are interested in understanding the effect of different PGCPS pre-K settings on

[1] Prekindergarten or pre-K refers to the academic year immediately preceding kindergarten entry.

kindergarten readiness. Additionally, they would like to know how the percentage of first-time kindergarten entrants who are "Demonstrating Readiness" has varied over the past three years, and the variation in school-readiness rates among different socio-demographic groups.

B. Research Questions

Based on the needs and interests of district leaders and program sponsors, we articulated the following three research questions:

1. *What is the trend of school readiness among first-time kindergarten entrants in PGCPS from SY2015 through SY2017?*
2. *To what extent does school readiness vary across different demographic groups?*
3. *To what extent does participation in different PGCPS prekindergarten programs impact school readiness for first-time kindergarten entrants?*

The first question focuses on the trend in school readiness among children starting their formal schooling in PGCPS beginning with the school year that began in August, 2014 (SY2015) through the 2017 school year (SY2017). This time-frame is of particular interest to the district and the PGCPS educators whose focus is early childhood education because it coincides with the statewide implementation of the Kindergarten Readiness Assessment (KRA). The second question identifies differences in school readiness among students of different demographic groups over the three cohorts of first-time kindergarten entrants under consideration. The third question addresses the level of school readiness among the same three cohorts of students based on the type of pre-K setting students experienced.

C. Organization of Report

This report is organized into five major sections. Following this introductory section, the second section describes the methods and procedures used in data collection and the analysis plan developed to answer the aforementioned research questions. Section III contains the findings, which provides the answers to the research questions. A discussion of the findings is contained in Section IV, which includes the conclusions that can be drawn from the findings. Finally, in Section V, we present the recommendations related to the district's prekindergarten policy.

II. METHODS AND PROCEDURES

A. *Data and Sampling*

The data needed to complete this study were obtained from testing results available from the Department of Testing, Research, and Evaluation (DTRE) and the Office of Early Childhood Education. Enrollment data for the years considered in this study were provided by the Information Technology (IT) department. Specifically, we utilized Kindergarten Readiness Assessment (KRA) results and enrollment for first-time kindergarteners from SY2015 through SY2017. We also utilized prekindergarten and Head Start enrollment files from SY2014 through SY2016 to determine which students in each kindergarten cohort participated in a PGCPS pre-K or Head Start program.

All KRA takers who were first-time kindergarten entrants in SY2015, SY2016, and SY2017 were included in the analysis of school readiness. In SY2015 and SY2016 the KRA was administered to all PGCPS kindergarten students. In SY2017, however, a randomly selected sample of 10% of the districtwide kindergarten class was administered the assessment. Table 1 outlines the sample, data source, and analytic procedure for each research question.

Table 1–Research Questions, Data Sources, and Analysis Techniques

Research Questions	Sample	Data Sources	Analytic procedure
1. What is the trend of school-readiness among first-time kindergarten entrants in PGCPS from SY2015 through SY2017?	KRA takers, SY15 thru SY17	KRA data	Descriptive Statistics
2. To what extent does school readiness vary across different demographic groups?	KRA takers, SY15 thru SY17	KRA data, Enrollment data	Descriptive Statistics
3. To what extent does participation in different PGCPS prekindergarten programs impact school readiness for first-time kindergarten entrants?	KRA takers, SY15 thru SY17	KRA data, Enrollment data	Treatment Effects model

B. *Measures*

School Readiness*:* The overall, i.e., composite, score on the KRA was the measure of school readiness used for this study. We used the results of the KRA, which is administered to students at the beginning of kindergarten, for each successive cohort (SY2015, SY2016, and SY2017). The KRA results are divided into three performance levels: Demonstrating Readiness, Approaching Readiness, and Emerging Readiness. For the purposes of this study, we created a new variable such that Demonstrating Readiness was coded as '1' and Approaching and

Emerging Readiness were coded '0'. This recoding allows us to compare the school-ready kindergarteners with those who have not yet achieved school readiness.

PGCPS Prekindergarten participation: Using enrollment files from the year preceding kindergarten entry, we identified kindergarten students who were enrolled in a PGCPS prekindergarten program. An indicator variable was created to denote pre-K enrollment.

Type of Prekindergarten Program: Using data provided by the Early Childhood Education office, we identified the pre-K programs that provided full- or half-day instruction for each of the three years covered by this study. We then created an indicator variable to denote the type of pre-K program each student attended.

Head Start: Using enrollment data provided by the Head Start office, we identified those who attended a Head Start prekindergarten program in PGCPS, and created a variable as an indicator of Head Start participation.

C. Data Analysis

To address the first research question, we use descriptive statistics to report the changes in school readiness over the three cohorts of first-time kindergarten entrants included in this study. The analysis considers the overall composite of the KRA as well as student readiness across the four domains: Language and Literacy, Mathematics, Social Foundations, and Physical Development.

The second research question was answered by disaggregating the school readiness measures for selected demographic subgroups. We then utilize comparison of means tests to determine the extent to which any differences in school readiness among the demographic subgroups were statistically significant.

To estimate the impact of PGCPS pre-K participation on school readiness, which is the goal of the third research question, we used the potential-outcomes estimation framework of the Average Treatment Effect (ATE) model. In this framework, there is a potential outcome (i.e., readiness for school) with treatment (PGCPS pre-K participation) and the opposite potential outcome without the treatment. Thus, each student has two potential outcomes: his/her observed outcome and a score for his/her counterfactual or unobserved outcome. Each student in the treatment group has an observed school-readiness score and each student in the non-treatment or comparison group has an observed school-readiness score. The unobserved potential outcome for treatment group students is the estimated outcome had they not attended a PGCPS pre-K program, while the unobserved potential outcome for comparison

group students is their estimated school readiness outcome had they attended a PGCPS pre-K program. Thus each student will have an observed and an estimated outcome.

The unobserved outcomes for students who participated in PGCPS' pre-K programs were estimated from observed outcomes of their respective propensity score-matched non-peers that did not participate in any PGCPS pre-K program. Similarly, the unobserved outcomes for students who did not participate in PGCPS pre-K programs were estimated from the observed outcomes of their respective propensity score-matched peers who participated in PGCPS pre-K programs. The use of propensity score matching allows us to estimate the counterfactual (e.g. the readiness-for-school outcome for a student in the treatment group had s/he not been treated) by using one or several observations from students who did not participate in a PGCPS pre-K program, but have similar observable characteristics. The observable characteristics of interest are gender, race/ethnicity, age (in weeks[2]), family income level, disability, and English language proficiency. We ran separate models of school readiness for each cohort (SY2015-SY2017) to determine the effect of prekindergarten participation (analysis # 1) and to examine the impact of full-day participation among PGCPS pre-K participants (analysis #2). Post-matching diagnostics confirmed that the matched peers were sufficiently similar on the observable characteristics noted above (See Appendix 1). For the second analysis, in addition to propensity score matching using the variables mentioned above, the number of days a child attended a PGCPS prekindergarten program was also used a covariate.

To determine the impact of PGCPS pre-K participation on school readiness, we calculated the average difference in the students' school readiness rates for participating in a PGCPS pre-K program (i.e. the treatment outcome, which is calculated from the observed school-readiness outcome for PGCPS pre-K participants and the estimated school-readiness outcome for non-participants in PGCPS pre-K programs) and for non-participating in PGCPS pre-K program (i.e., the non-treatment or comparison outcome, which is calculated from the observed school-readiness outcomes for students who did not participate in PGCPS pre-K programs and the estimated school-readiness outcomes for PGCPS pre-K participants). For the analysis of the differential impact of full-day PGCPS pre-K programs, we calculated the average difference in the school-readiness rates for attending a full-day PGCPS pre-K class (i.e. the treatment outcome, which is calculated from the observed school-readiness rate for participants in full-day pre-K classes and the estimated school readiness rates for participants in PGCPS in half-day pre-K classes had they attended a full-day pre-K) and for attending a half-day PGCPS pre-K class (i.e., the non-treatment or comparison outcome, which is calculated from the

[2] Age in weeks was calculated by subtracting the child's date of birth from the September 1st "cut-off" date for entrance in Prekindergarten, and converting the difference into weeks.

observed school-readiness outcomes for participants in PGCPS in half-day pre-K classes and the estimated school-readiness outcomes for participants in full-day pre-K classes had they not attended full-day pre-K classes).

The average of the scores for the treatment scenario is the average proficiency rate had **all** students attended PGCPS pre-K programs (or attended full-day classes)[3] and the average of the scores for the non-treatment scenario is the average proficiency rate had **all** students not attended PGCPS pre-K programs (or attended half-day classes). The difference in the average school-readiness rates between treatment and non-treatment scenarios for each analysis is the average treatment effect (ATE). The ATE is equivalent to the impact of PGCPS pre-K attendance for all incoming kindergarten students and the impact of full-day classes for all students who attended PGCPS pre- programs. The analyses were conducted in STATA 14.

The extent to which the impact of PGCPS prekindergarten participation is educationally important was assessed by calculating an improvement index and the calculated effect size. In determining the educational significance of the effect size of, we utilized the standards established by the U.S. Department of Education's What Works Clearinghouse (WWC) standards for program interventions in education. The specific effect size reported in this report is the standardized mean difference or Hedge's *g* effect size index. According to the WWC handbook (2013), an effect size of 0.25 or larger is considered educationally important. The effect size of 0.25 is equivalent to an improvement index of 10 percentile points. That is, an intervention program is substantively important if participation leads to a 10% increase in percentile rank for an average student in the non-intervention group, or stated differently, that 60% of the students in the intervention group score above the non-intervention group mean.

[3] It is important to note that the average proficiency rate is the potential proficiency rate for all incoming kindergarteners had all of them been enrolled in a PGCPS pre-K program the previous year (analysis #1) and had all of the students that were enrolled in PGCPS pre-K programs were provided full-day instruction.

III. FINDINGS

The results of the analyses are presented in this section. The presentation in each sub-section is organized in the sequence of the research questions.

A. School Readiness, SY2015 through SY2017

Research Question 1: What is the trend of school readiness among first-time kindergarten entrants in PGCPS from SY2015 through SY2017?

Table 2 presents the school readiness rates for the school years 2015, 2016, and 2017. School readiness was higher in SY2016 than in SY2015, overall and for each of the domains measured by the KRA. In SY2016 the district's school readiness average increased to 38.3%, a growth of 3.9 percentage points. In SY2017, however, the school readiness rate among first-time kindergarten entrants decreased to 34.3%, a decline of 4 percentage points. Compared to the baseline year of 2015, the percentage of school ready students in 2017 is essentially the same as 2015. See Table 2.

Table 2–Percent Demonstrating School Readiness, overall and by domain, SY2015–SY2017

KRA Domain	SY2015	SY2016	SY2017
Overall School Readiness	34.4	38.3	34.3
Math	27.0	32.0	29.8
Language and Literacy	35.0	36.0	33.8
Social Foundations	42.0	52.0	45.2
Physical Development	46.0	55.0	49.9

The overall school readiness score is comprised of four KRA domains. The readiness rates for each of the domains are also presented in Table 2. In SY2016 the district school readiness rate in Language and Literacy increased by a percentage point and readiness in Math increased by five percentage points compared with SY2015. The percentage of students demonstrating readiness in Social Foundations and Physical Development in SY2016 improved by ten and nine percentage points, respectively, from the previous year. The decline in overall school readiness between SY2016 and SY2017 was also reflected all the domains measured by the KRA. The decline, however, is smaller in Math and Literacy (2.2 percentage points) but higher in Social Foundations and physical development (6.8 and 5.1 percentage points, respectively). In sum, the notable SY2016 gains in social foundations and physical development made by the SY2016 cohort were cut by more than half in SY2017.

B. *Socio-Demographic Differences in School Readiness, SY2015–SY2017*

Research Question 2: To what extent does school readiness vary across different demographic groups?

Table 3 displays the results from the descriptive analysis of school readiness by demographic group. The results indicate that there is a persistent gender gap in school readiness. Female kindergarten entrants are better prepared for school than their male counterparts, as shown by the difference in the readiness rates for boys and girls, which hovers around 10 percentage points from SY2015 through SY2016. The analysis also shows that there are persistent gaps in school readiness depending on the race and ethnicity of the students. For each of the three cohort years, Hispanic students have the lowest percentages of school readiness, with only about one out of five Hispanic students deemed school-ready as measured by the KRA. The readiness rate for white students was the highest compared with the other racial/ethnic subgroups. About one-half of the white kindergarten entrants in SY2015 were deemed school-ready. The rate increased to nearly 60% in SY2016 and to 70% in SY2017, which is approximately double the readiness rate for the SY2017 cohort as a whole.

Table 3–Percent Demonstrating School Readiness by Socio-demographic Group, SY2015–SY2017

Student Characteristics	SY2015		SY2016		SY2017	
ALL STUDENTS	**9,689**	**34.4%**	**9,165**	**38.2%**	**1,120**	**34.2%**
Male[r]	4,887	29.2%	4,615	33.3%	569	29.7%
Female	4,802	39.7%***	4,550	43.2%***	551	38.8%***
African American/Black	5,392	41.7%***	5,273	44.9%***	672	39.6%***
Hispanic	3,346	19.2%***	3,058	22.3%***	356	18.3%***
White[r]	538	50.6%	523	59.3%	67	70.1%
Asian/ Pacific Islander	274	38.0%***	265	46.0%***	21	23.8%***
FaRMs	7,120	29.1%***	6,179	31.8%***	752	27.7%***
Non-FaRMs[r]	2,569	49.2%	2,998	51.5%	368	47.6%
English Language Learner	3,006	15.3%***	2,756	18.9%***	306	17.6%***
Sufficient English Language Skills[r]	6,683	43.0%	6,421	46.5%	814	40.4%
Special Education	685	11.7%***	568	14.3%***	66	19.7%**
General Education[r]	9,004	36.1%	8,609	39.8%	1,054	35.1%

[r] indicates reference group category in the group comparisons ***$p < .01$; **$p <. 05$

The upward trend in the school-readiness rate for white students from SY2015 through SY2017 is contrary to the pattern of readiness rates for most other socio-demographic subgroups across the same three years, with the exception of Special Education students. The readiness rates for most subgroups increased in SY2016 from SY2015, but declined in SY2017 from the previous year to the point where there is little change in the disaggregated readiness rates when comparing SY2017 with SY2015. See Table 3.

Children of families with low-socioeconomic status (FaRMs) underperformed by about 20 percentage points for each of the three school years under consideration in this study. Among English Language Learners (ELLs), the readiness gap between them and those with sufficient English language skills is about 28 percentage points in SY2015 and '16; the gap falls to approximately 23 percentage points in SY2017. As noted above, the school-readiness rate for students receiving special education services increased from about 12% in SY2015 to nearly 20% in SY2017, which decreased the gap between the special education and non-special education students by approximately 10 percentage points.

C. *Prekindergarten experiences and Kindergarten Readiness, SY2015-SY2017*

Research Question 3: To what extent does participation in different PGCPS prekindergarten programs impact school readiness for first-time kindergarten entrants?

Table 4 displays the percentage of students deemed school-ready for the three cohorts used in the analysis disaggregated by type of prekindergarten experience.

Table 4–Percent Demonstrating School Readiness by Pre-K Experience, SY2015–SY2017

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
TOTAL	**9,689**	**34.4%**	**9,809**	**38.3%**	**1,120**	**34.3%**
Pre-K experience						
PGCPS Pre-K Program Participants	4,471	35.0%	4,647	39.2%	564	36.0%
Non-participants	5,218	33.8%	5,162	37.3%	556	32.4%
Type of PGPCS Pre-K Programs						
Full-Day	702	45.7%	1,271	47.1%	199	41.7%
Half-Day	3,156	31.8%	2,767	34.9%	280	30.0%
Head Start	613	39.5%	609	41.6%	85	42.4%

For all three cohorts, the percentage of PGCPS pre-K program participants demonstrating readiness for school at the start of kindergarten was higher than for those who did not attend PGCPS pre-K programs. Furthermore, the size of the percentage differences has progressively increased over the last three school years. While this is the hoped-for positive result of increased investments in prekindergarten education, we cannot simply attribute the difference in school readiness to PGCPS pre-K participation without consideration to the socio-demographic characteristics of students in both groups.

As discussed in the introduction section, enrollment in PGCPS prekindergarten programs is based on income requirements, which means the pool of PGCPS pre-K participants is likely to be fundamentally different from the pool of kindergarteners that did not participate in a PGCPS pre-K program. Furthermore, we know the PGCPS prekindergarten cohorts had larger percentages of Hispanic students, ELLs, students receiving FaRMs, and students receiving special education services, than the cohorts of students entering a PGCPS kindergarten in each of the three years under consideration for this study. (See Appendix 2 for a breakdown of the socio-demographic composition of the PGCPS pre-K participants versus non-participants.) To account for the observable differences between the two groups, we conducted an analysis to establish whether PGCPS pre-K students were more prepared for kindergarten using the treatment effect with propensity score matching method discussed in the Data Analysis section.

Impact of PGCPS Prekindergarten program on School Readiness

The findings from the treatment effect analysis suggest that participation in a PGCPS prekindergarten program would result in higher school-readiness rates relative to non-participation in any PGCPS prekindergarten program. Table 5 reports the estimated school-readiness rates if all first-time kindergarteners had attended a PGCPS pre-K program and if none had attended any PGCPS pre-K program for SY2015 through SY2017. Also reported in Table 5 are the estimated effects of PGCPS pre-K programs (i.e., differences in the estimated school-readiness rates under the treatment and non-treatment scenarios) along with statistics to assess statistical and educational significance of the estimated effects. The third column (A) in Table 5 denotes the percentage of PGCPS incoming kindergarteners estimated to be school-ready had all attended a PGCPS pre-K program. The results of the analysis show that the school-readiness rates in PGCPS would have been 39%, 44% and 41.1% in SY2015, SY2016 and SY2017, respectively, if all of the incoming kindergarten students had participated in PGCPS prekindergarten programs. Alternatively, if none of the students in the kindergarten cohorts had attended a PGCPS prekindergarten (column B), the percentage demonstrating readiness would have been 29.2, 31.8, and 24.7 for SY2015, SY2016 and SY2017, respectively.

Table 5–Estimated School-Readiness Rates and Effects of PGCPS Pre-K participation on School Readiness, SY2015-SY2017

School Year	N	Estimated Readiness Rate if ALL 1st Time Kindergarteners Attended PGCPS Pre-K (A)	Estimated Readiness Rate if NO 1st Time Kindergartener Attended PGCPS Pre-K (B)	Estimated Effect of PGCPS Pre-K Program (A-B)	*p*-value	Effect Size
SY2015	9,689	39.0%	29.2%	9.8%	0.000	0.27
SY2016	9,171	44.0%	31.8%	12.1%	0.000	0.32
SY2017*	9171	41.1%	24.7%	16.4%	0.000	0.46

*This is the weighted-sample size. The number of students tested for KRA was 1120.

The program effect of PGCPS prekindergarten participation on readiness for school was 9.8, 12.1, and 16.8 percentage points, for SY2015, SY2016, and SY2017, respectively. The program effects are statistically significant at $p < 0.001$ and educationally important with an *effect sizes (Hedges's g) of* 0.27, 0.32, and 0.46, for the three cohorts.[4] These findings suggest that PGCPS prekindergarten programs do a better job of preparing children for school than other prekindergarten settings for incoming kindergarteners.

For context, the SY2015 kindergarten cohort had an observed school readiness rate of 34.4%; the estimated school-readiness rate from the model suggests that had all kindergarten entrants been enrolled in a PGCPS pre-K program for the school year immediately preceding kindergarten entry, the SY2015 readiness rate would have been 4.2 percentage points higher at 39.0%. Similarly, for SY2016 if all incoming kindergarteners had attended a PGCPS prekindergarten program, the percentage of PGCPS kindergarteners demonstrating school readiness would have been higher by 5.7 percentage points, and for SY2017 the readiness rate would have been higher by 6.8 percentage points (See column D in Table A3-1 in Appendix 3). It can also be inferred from the results of the analysis that, at the prevailing PGCPS pre-K attendance rate for each cohort, pre-K programs have improved school readiness by 5.2, 6.5, and 9.6 percentage points for SY2015, SY2016, and SY2017, respectively (See column E in A3-1 in Appendix 3). For example, in SY2017, the overall rate of school readiness would have been 9.6 percentage points lower without the pre-K program when only 50.4% of the incoming kindergarten cohort attended PGCPS pre-K program. In SY2015, with a 46.1% pre-K participation rate, and in SY2016, with a 47.4% pre-K participation rate, the overall readiness

[4] The effect size of 0.25 could be translated to an improvement index of 10 percentile points. We could then conclude that attending PGCPS pre-K is substantively important if attendance leads to a 10% increase in percentile rank for an average student in the non-PGCPS pre-K group. Or stated differently, that 60% of the PGCPS pre-K group demonstrates readiness has percentage of readiness above the non-PGCPS group percentage.

rates would have been lower by 5.2 and 6.5 percentage points, respectively, without the pre-K program. In sum, even as the observed rate of school readiness declined from SY2016 to SY2017, the impact of PGCPS pre-K program participation has continued to increase.

Impact of PGCPS Type of Prekindergarten Program on School Readiness

In addition to analyzing differences in school readiness between students who attended PGCPS pre-K programs and those who did not, we also analyzed the differential impact of the type of PGCPS pre-K program the incoming kindergartener attended: full-day pre-K (including Head Start) vs. half-day pre-K.[5]

The results of this analysis, which are presented in Table 6, indicate that PGCPS full-day pre-K or Head Start programs prepare students for school better than PGCPS half-day pre-K programs as measured by the percentage demonstrating school readiness on the KRA. As reported in Table 6, the estimated effect indicates the school-readiness rate among kindergarten entrants who attended PGCPS full-day pre-K or Head Start programs is estimated to be 6.6 and 6.2 percentage points higher than the rate for half-day PGCPS pre-K participants for the SY2015 and SY2016 cohorts, respectively, after adjusting for attendance rate[6]. While the results are statistically significant, the calculated effect sizes indicate that the program effects of full-day pre-K programs are not educationally significant; they do not meet the effect size threshold of 0.25.

Table 6–Estimated School-Readiness Rates for All Pre-K Students in Full-day or Head Start Program and All Pre-K Students in Half-day Program and the Effects of Full-day/Head Start Program over Half-day Program, SY2015-SY2017

School Year	N	Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Full-Day Classes (Pre-K and Head Start) (A)	Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Half Day Classes (B)	Estimated Effect of PGCPS Full-day Pre-K Program over Half-day Program (A-B)	*p*-value	Effect Size
SY2015	4,467	39.6%	33.0%	6.6%	0.000	0.17
SY2016	4,355	42.3%	36.1%	6.2%	0.000	0.16
SY2017	4,572*	39.8%	32.4%	7.4%	0.071	0.19

*This is the weighted-sample size. The number of students tested for KRA in SY2017 was 564.

[5] A separate treatment effects model comparing full-day pre-K (excluding Head Start) vs. half-day pre-K programs was conducted and the resulted were identical with the results for full-day pre-K (including Head Start) vs. half-day pre-K model. See Appendix A3, Tables A3-3 and A3-4.

[6] Though not reported here, the results of the analysis show that there are no statistically significant or educationally important differences in school-readiness rates between students who attended PGCPS Head Start programs and PGCPS full-day pre-K programs. This is consistent with information obtained from the Office of Early Childhood Education indicating that curriculum utilized in PGCPS Head Start and PGCPS pre-K programs are identical.

The results of this analysis can be interpreted as follows: If all PGCPS pre-K attendees were provided with a full-day program, the school-readiness rate for the SY2015 cohort who attended pre-K in PGCPS sites would have been 39.6%; and the readiness rate for the SY2016 cohort would have been 42.3%. In SY2017, full-day participation for all pre-K attendees would have resulted in a readiness rate of 39.8% for that cohort.

The observed rates of school readiness for all students who were enrolled in PGCPS pre-K programs (i.e., at the corresponding rates of full-day class attendance for each cohort) for SY2015, SY2016, and SY2017 were 35.0%, 39.2%, and 36.0%, respectively. If all PGCPS pre-K students attended half-day classes, the corresponding rates of school readiness for each cohort would have been 33.0%, 36.1%, and 32.4%. Thus, even at the prevailing rates of full-day class attendance, full-day pre-K/Head Start programs improve the overall school readiness rate of PGCPS pre-K students by 2.0, 3.0, and 3.6 percentage points for the SY2015, SY2016 and SY2017 cohorts, respectively. However, if all PGCPS pre-K program participants had enrolled in full-day classes, the school readiness rates would have even been higher by an additional 4.6 3.1 and 3.8 percentage points for each respective cohort (See Table A3-2 in Appendix 3).

IV. SUMMARY AND CONCLUSION

A summary of the findings discussed in the previous section, along with conclusions are presented here.

A. School Readiness, Overall and by Socio-demographic Group, SY2015 to SY2017

The findings presented in the previous section showed that readiness for school among the district's kindergarteners was higher in SY2016 compared with the previous baseline year. In SY2016 the district school readiness rate increased to 38.3% from 34.4% in SY2015, a growth of 3.9 percentage points. In SY2017, however, the district school-readiness rate decreased to 34.3%, a decline of 4 percentage points. Compared to the baseline year of 2015, the percentage of school ready students in 2017 is essentially the same.

The findings also show that there are persistent gaps in school readiness among different socio-demographic groups. Male kindergarteners demonstrate lower rates of readiness in comparison to their female peers. On the aggregate, incoming kindergarteners who are Hispanic, English Language Learners (ELLs), come from poor families, or require special education services start school less prepared than students without those socio-demographic characteristics.

B. School Readiness and prekindergarten experience, SY2015-SY2017

The findings from the treatment effect analysis indicate that attending PGCPS prekindergarten programs increases the school-readiness rate of first-time kindergarteners over not attending a PGCPS pre-K program the previous year. The program effect of PGCPS prekindergarten participation on readiness for school was 9.8, 12.1, and 16.4 percentage points, respectively, for the SY2015, SY2016, and SY2017 cohorts of incoming kindergarteners. For example, the SY2015 kindergarten cohort had a readiness rate of 34.4%; the model suggests that had the non-participants also been enrolled in a PGCPS pre-K program for the school year immediately preceding kindergarten entry, the SY2015 readiness rate would have been 39%. Had all of the SY2016 incoming kindergarteners been enrolled in a PGCPS prekindergarten program, the percentage of PGCPS kindergarteners demonstrating school readiness would have been 44%; for SY2017 the readiness rate would have been 41.1%. Comparatively, the school-readiness rate among incoming kindergarteners across the state of Maryland was 47% for SY2015, 45% for SY2016, and 43% for SY2017. Thus, universal participation in a PGCPS prekindergarten program among PGCPS first-time kindergarteners would have resulted in their demonstrating readiness for school close to the state average for SY2016 and SY2017. Alternatively, if none of the students in the kindergarten cohorts had

attended prekindergarten in PGCPS the percentage demonstrating readiness would have been 29.2, 31.8, and 24.7 for SY2015, SY2016 and SY2017, respectively. Therefore, we conclude that PGCPS prekindergarten programs do a better job of preparing children for school than other prekindergarten settings experienced by incoming kindergarteners.

The findings further suggests that PGCPS prekindergarten participants who were in full-day or Head Start programs demonstrated school readiness at rates higher than the incoming kindergarteners who were enrolled in half-day programs. Specifically, we estimate the school-readiness rate among incoming PGCPS kindergarteners who attended PGCPS pre-K programs the preceding school year would have been higher by 6 to 7 percentage points had all PGCPS prekindergarten participants been provided with full-day programs. The conclusion, therefore, is that PGCPS full-day prekindergarten programs are better than half-day programs at preparing children for school.

V. RECOMMENDATIONS

The findings from this study certainly confirm the value of early childhood education for providing students with the foundation needed to start kindergarten ready to learn. While this is a positive result, the scope of this research was limited to the trends in school readiness in PGCPS and the effects of PGCPS prekindergarten participation on school-readiness rates. What is lacking is the knowledge of the costs associated with providing prekindergarten education to the approximately 50% of kindergarten students who did not attend PGCPS pre-K, and whether the costs would justify the increase in overall readiness that we estimated would occur had all kindergarten students received a PGCPS pre-K education. With this in mind, we offer the following recommendations for future research:

Determine the lasting effect of PGCPS prekindergarten education. Even though we determined that participation in a PGCPS prekindergarten program is associated with an increase in the school-readiness rate, it may be that kindergarten helps the not-yet-ready students to catch-up with their *already-ready* peers so that they are comparably prepared for first grade. Therefore, we recommend that we continue to follow these cohorts of kindergarten entrants over the first few years of elementary school in order to study and analyze their academic performance and its relationship, if any, to their prekindergarten preparation.

Conduct an analysis to determine the size of the investment necessary to increase the school-readiness rates. Using budget data and other sources of cost data, we could estimate the financial costs associated with meeting the district's school-readiness rate goals. It is only when we have a complete picture of the costs needed to realize the sought-after benefit that sound policy decisions about the expansion of early childhood education can be made.

REFERENCES

Institute of Education Sciences. 2013. What Works Clearinghouse™. Procedures and Standards Handbook (Version 3.0). US Department of Education, February 2013.

MSDE. 2016. Readiness Matters! The 2015-2016 Kindergarten Readiness Assessment Report. Maryland State Department of Education

MSDE. 2016. The 2014-2015 Kindergarten Readiness Assessment Report. Maryland State Department of Education

APPENDIX 1: BALANCE OF COVARIATES TESTS FOR THE MATCHED-SAMPLES

The Treatment effects model in STATA estimates the Average Treatment Effects by matching each subject to a single subject with the opposite treatment whose propensity score is closest. The model also produces a table showing if the matched sample results indicate that matching on the estimated propensity score balanced the covariates. If the standardized differences are all close to zero, and the variance ratios are all close to one, the covariates are balanced.

The matched samples are well balanced on all the demographic variables for all three cohorts. However, the variance ration is not balanced for Age at the cutoff date for Prekindergarten entry. There was more variation in age (expressed in age in weeks during September 1 of Pre-K year) within the Non-PGCPS prekindergarten groups that the PGCPS prekindergarten group.

SY2015:

```
. *Test of Balance for SY2015

.
. tebalance summarize
note: refitting the model using the generate() option

  Covariate balance summary
                                              Raw       Matched
                        ----------------------------------------
                        Number of obs =       9,689        19,378
                        Treated obs   =       4,471         9,689
                        Control obs   =       5,218         9,689
                        ----------------------------------------

------------------------------------------------------------------
                     |  Standardized differences          Variance ratio
                     |        Raw     Matched              Raw     Matched
---------------------+--------------------------------------------------
               White |   .0955884   -.0216436         1.05297   .9880029
               Black |  -.0877141    .0045846        1.023573   .9987271
                SPED |   .3052444    .0500249        3.029766   1.187856
               FARMS |   .6352786   -.0295553         .4548013   1.032418
                 ELL |   .1986383   -.0085461         1.17422   .9926325
           Hispanic1 |   .2358646   -.0357179        1.161946   .9762685
                Male |   .0480946    .0220884         .9990099   .9995167
          Weeks_b4PreK |  -.019178   -.0713097         .6038529   .7381034
------------------------------------------------------------------
```

SY2016

```
. *Test of Balance for SY2016

.
. tebalance summarize
note: refitting the model using the generate() option

  Covariate balance summary
                                                Raw       Matched
                        ------------------------------------------
                        Number of obs =         9,171        18,342
                        Treated obs   =         4,368         9,171
                        Control obs   =         4,803         9,171
                        ------------------------------------------

------------------------------------------------------------------------------
                     | Standardized differences          Variance ratio
                     |        Raw     Matched              Raw     Matched
---------------------+--------------------------------------------------------
               White |    .1233272    .0068167       1.076232       1.004
               Black |   -.1468771    .0077603       1.053246    .997151
                SPED |    .4009204    .0120116       6.325018      1.0459
               FARMS |    .6802447    .0067452       .5632274   .9950072
                 ELL |    .2388369    .0261972       1.229834   1.023261
           Hispanic1 |    .2622123   -.0471474       1.201553   .9675059
                Male |    .0244772    .0008723        .999656   .9999804
       Weeks_b4PreK |   -.0580649   -.0018517       .6646427   .1952363
------------------------------------------------------------------------------
```

SY2017

```
. *Test of Balance for SY2017

.
. tebalance summarize
note: refitting the model using the generate() option

  Covariate balance summary
                                                Raw       Matched
                        ------------------------------------------
                        Number of obs =         1,120        2,240
                        Treated obs   =           564        1,120
                        Control obs   =           556        1,120
                        ------------------------------------------

------------------------------------------------------------------------------
                     | Standardized differences          Variance ratio
                     |        Raw     Matched              Raw     Matched
---------------------+--------------------------------------------------------
               White |   -.132919    .0209684        .898833   1.015847
               Black |  -.0181506    .0054683       1.008829    .997738
                SPED |    .4480009    .0923547       13.69861   1.457437
               FARMS |    .7390011   -.0458081       .5556564   1.035265
                 ELL |    .1842792   -.0414372       1.208501   .9617111
           Hispanic1 |    .1671355   -.0264256       1.140793   .9819913
                Male |    .0890805   -.0625626       .9971662     1.0055
       Weeks_b4PreK |   -.0190381   -.0903345       .5805743   .5774516
------------------------------------------------------------------------------
```

APPENDIX 2: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF KRA TAKER COHORTS, SY2015 THROUGH SY2017

Table A2-1–Socio-demographic characteristics of PGCPS KRA takers, SY2015

Student Characteristics	TOTAL		PGCPS Pre-K Participant		PGCPS Pre-K Non-participant	
	N	Percent	N	Percent	N	Percent
ALL STUDENTS	**9,689**	**100.0%**	**4,471**	**46.1%**	**5,218**	**53.9%**
Female	4,802	49.6%	2,158	48.3%	2,644	50.7%
Male	4,887	50.4%	2,313	51.7%	2,574	49.3%
African American/Black	5,392	55.7%	2,368	53.0%	3,024	58.0%
Hispanic	3,346	34.5%	1,813	40.6%	1,533	29.4%
White	538	5.6%	147	3.3%	391	7.5%
Asian/Pacific Islander	274	2.8%	99	2.2%	175	3.4%
Other/Multi/Not-identified	139	1.4%	44	1.0%	95	1.8%
Non-FARMs	2,569	26.5%	550	12.3%	2,019	38.7%
FARMs	7,120	73.5%	3,921	87.7%	3,199	61.3%
Sufficient English Language Skills	6,683	69.0%	2,863	64.0%	3,820	73.2%
English Language Learner	3,006	31.0%	1,608	36.0%	1,398	26.8%
General Education	9,004	92.9%	3,965	88.7%	5,039	96.6%
Special Education	685	7.1%	506	11.3%	179	3.4%
PGCPS Full-day Pre-K	702	7.2%	702	15.7%		
PGCPS Half-day Pre-K	3,156	32.6%	3,156	70.6%		
PGCPS Head Start	613	6.3%	613	13.7%		
NO PGCPS Pre-K experience	5,218	53.9%			5,218	100.0%

Table A2-2–Socio-demographic characteristics of PGCPS KRA takers, SY2016

Student Characteristics	TOTAL		PGCPS Pre-K Participant		PGCPS Pre-K Non-participant	
	N	Percent	N	Percent	N	Percent
ALL STUDENTS	**9,809**	**100.0%**	**4,647**	**47.4%**	**5,162**	**52.6%**
Female	4,817	49.2%	2,244	48.3%	2,573	50.0%
Male	4,977	50.8%	2,401	51.7%	2,576	50.0%
African American/Black	5,562	56.7%	2,499	53.8%	3,063	59.3%
Hispanic	3,342	34.1%	1,848	39.8%	1,494	28.9%
White	547	5.6%	157	3.4%	390	7.6%
Asian/Pacific Islander	296	3.0%	120	2.6%	176	3.4%
Other/Multi/Not-identified	62	0.6%	23	0.5%	39	0.8%
Non-FARMs	3,188	32.5%	818	17.6%	2,370	45.9%
FARMs	6,621	67.5%	3,829	82.4%	2,792	54.1%
Sufficient English Language Skills	6,775	69.1%	2,995	64.5%	3,780	73.2%
English Language Learner	3,034	30.9%	1,652	35.5%	1,382	26.8%
General Education	9,094	92.7%	4,027	86.7%	5,067	98.2%
Special Education	715	7.3%	620	13.3%	95	1.8%
PGCPS Full-day Pre-K	1,271	13.0%	1,271	27.4%		
PGCPS Half-day Pre-K	2,767	28.2%	2,767	59.5%		
PGCPS Head Start	609	6.2%	609	13.1%		
NO PGCPS Pre-K experience	5,162	52.6%			5,162	100.0%

Table A2-3–Socio-demographic characteristics of PGCPS KRA takers, SY2017

Student Characteristics	TOTAL		PGCPS Pre-K Participant		PGCPS Pre-K Non-participant	
	N	Percent	N	Percent	N	Percent
ALL STUDENTS	**1,120**	**100.0%**	**564**	**50.4%**	**556**	**49.6%**
Female	551	49.2%	265	47.0%	286	51.4%
Male	569	50.8%	299	53.0%	270	48.6%
African American/Black	672	60.0%	334	59.2%	338	60.8%
Hispanic	356	31.8%	201	35.6%	155	27.9%
White	67	6.0%	15	2.7%	52	9.4%
Asian/Pacific Islander	21	1.9%	12	2.1%	9	1.6%
Other/Multi/Not-identified	4	0.4%	2	0.4%	2	0.4%
Non-FARMs	368	32.9%	94	16.7%	274	49.3%
FARMs	752	67.1%	470	83.3%	282	50.7%
Sufficient English Language Skills	814	72.7%	387	68.6%	427	76.8%
English Language Learner	306	27.3%	177	31.4%	129	23.2%
General Education	1,054	94.1%	502	89.0%	552	99.3%
Special Education	66	5.9%	62	11.0%	4	0.7%
PGCPS Full-day Pre-K	199	17.8%	199	35.3%		
PGCPS Half-day Pre-K	280	25.0%	280	49.6%		
PGCPS Head Start	85	7.6%	85	15.1%		
NO PGCPS Pre-K experience	556	49.6%			556	100.0%

APPENDIX 3: SUPPLEMENTAL DATA

Table A3-1–The Estimated and Observed Rates of School Readiness for ALL PGCPS Kindergarteners, SY2015-SY2017

School Year	(a) Estimated Readiness Rate if ALL 1st Time Kindergarteners Attended PGCPS Pre-K	(b) Observed School Readiness Rate at the prevailing PGCPS Pre-K Attendance Rate	(c) Estimated Readiness Rate if NO 1st Time Kindergartener Attended PGCPS Pre-K	(d) Possible Additional Improvement with 100% PGCPS Pre-K Attendance Rate (c-b)	(e) Achieved Improvement at the Prevailing PGCPS Pre-K participation Rate (b-a)
SY2015	39.0%	34.4%	29.2%	4.6%	5.2%
SY2016	44.0%	37.3%	31.8%	5.7%	6.5%
SY2017	41.1%	34.3%	24.7%	6.8%	9.6%

Table A3-2–The Estimated and Observed Rates of School Readiness for PGCPS Kindergarteners who participated in PGCPS pre-K programs, SY2015-SY2017

School Year	(a) Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Full-Day Classes (Pre-K and Head start)	(b) Observed School Readiness rate at current level of Full-Day classes among PGCPS Pre-K participants	(c) Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Half-Day Classes	(d) Possible Added Improvement with all classes as Full-Day (a-b)	(e) Achieved Improvement at the Prevailing Full-Day attendance rate (b-c)
SY2015	39.6%	35.0%	33.0%	4.6%	2.0%
SY2016	42.3%	39.2%	36.1%	3.1%	3.1%
SY2017	39.8%	36.0%	32.4%	3.8%	3.6%

Table A3-3–Estimated School-Readiness Rates for All Pre-K Students in Full-day Pre-K (Non-Head Start) Program and All Pre-K Students in Half-day Program and the Effects of Full-day/Head Start Program over Half-day Program, SY2015-SY2017

School Year	N	Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Full-Day Classes (Pre-K and Head Start) (A)	Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Half Day Classes (B)	Estimated Effect of PGCPS Full-day Pre-K Program over Half-day Program (A-B)	*p*-value	Effect Size
SY2015	3,858	39.4%	32.7%	6.6%	.001	0.17
SY2016	3,766	42.1%	36.3%	5.8%	.001	0.15
SY2017*	3,886	38.4%	32.5%	5.9%	.198	0.16

*This is the weighted-sample size. The number of students tested for KRA in SY2017 was 479.

Table A3-4–The Estimated and Observed Rates of School Readiness for PGCPS Kindergarteners who participated in PGCPS pre-K programs, SY2015-SY2017

School Year	(a) Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Full-Day Classes (Non-Head Start)	(b) Observed School Readiness rate at current level of Full-Day classes among PGCPS Pre-K participants	(c) Estimated Readiness Rate if ALL PGCPS Pre-K Students Attended Half-Day Classes	(d) Possible Added Improvement with all classes as Full-Day (a-b)	(e) Achieved Improvement at the Prevailing Full-Day attendance rate (b-c)
SY2015	39.4%	35.0%	32.7%	4.4%	2.3%
SY2016	42.1%	39.2%	36.3%	2.9%	2.9%
SY2017	38.4%	36.0%	32.5%	2.4%	3.5%

APPENDIX 4: SCHOOL-READINESS RATES BY SCHOOL

Table A4-1–Observed School-Readiness Rates by school, SY2015 through SY2017

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
TOTAL	**9,689**	**34.4%**	**9,809**	**38.3%**	**1,120**	**34.3%**
Accokeek Academy	64	43.8%	80	50.0%	11	36.4%
Adelphi ES	102	24.5%	111	25.2%	11	27.3%
Allenwood ES	27	48.1%	40	30.0%	5	20.0%
Andrew Jackson Academy	45	48.9%	57	43.9%	9	22.2%
Apple Grove ES	60	21.7%	60	18.3%	6	50.0%
Ardmore ES	59	39.0%	62	54.8%	7	57.1%
Arrowhead ES	45	17.8%	44	15.9%	8	50.0%
Avalon ES	59	25.4%	47	21.3%	3	100.0%
Baden ES	29	37.9%	24	54.2%	4	75.0%
Barack Obama ES	73	27.4%	85	45.9%	12	41.7%
Barnaby Manor ES	46	30.4%	71	32.4%	9	11.1%
Beacon Heights ES	65	23.1%	76	40.8%	7	28.6%
Beltsville Academy	99	27.3%	101	25.7%	12	33.3%
Benjamin D Foulois Academy	45	60.0%	49	59.2%	6	33.3%
Berwyn Heights ES	81	33.3%	56	28.6%	9	22.2%
Bladensburg ES	92	21.7%	88	23.9%	12	8.3%
Bond Mill ES	93	60.2%	89	44.9%	12	91.7%
Bradbury Heights ES	78	34.6%	64	43.8%	9	11.1%
Brandywine ES	53	30.2%	43	37.2%	8	25.0%
Calverton ES	143	21.0%	110	28.2%	12	41.7%
Capitol Heights ES	17	29.4%	18	61.1%	2	0.0%
Carmody Hills ES	62	38.7%	60	61.7%	8	50.0%
Carole Highlands ES	52	34.6%	82	32.9%	5	0.0%
Carrollton ES	87	27.6%	77	16.9%	10	40.0%
Catherine T Reed ES	79	39.2%	73	41.1%	14	35.7%

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
Cesar Chavez ES	71	32.4%	71	40.8%	6	33.3%
Cherokee Lane ES	68	38.2%	76	36.8%	8	25.0%
Chesapeake Math & IT PCS	48	18.8%	70	52.9%	10	50.0%
Chillum ES	56	30.4%	51	11.8%	3	0.0%
Clinton Grove ES	35	22.9%	37	54.1%	4	25.0%
Columbia Park ES	66	19.7%	62	9.7%	8	37.5%
Concord ES	50	54.0%	50	46.0%	6	66.7%
Cool Spring ES	144	11.1%	114	21.1%	12	0.0%
Cooper Lane ES	67	32.8%	62	6.5%	7	14.3%
Cora L Rice ES	97	45.4%	78	56.4%	14	7.1%
Deerfield Run ES	123	31.7%	88	40.9%	14	42.9%
District Heights ES	49	32.7%	63	33.3%	6	33.3%
Dodge Park ES	78	29.5%	62	37.1%	8	37.5%
Dora Kennedy French Immersion	See Robert Goddard French Immersion		88	64.8%	12	50.0%
Doswell E Brooks ES	39	12.8%	30	66.7%	4	25.0%
Edward M Felegy ES	139	25.9%	116	25.9%	12	16.7%
EXCEL Academy PCS	51	60.8%	50	68.0%	3	66.7%
Flintstone ES	76	13.2%	53	18.9%	7	14.3%
Forest Heights ES	5	60.0%	28	32.1%	4	50.0%
Fort Foote ES	46	47.8%	48	54.2%	3	33.3%
Fort Washington Forest ES	28	42.9%	35	51.4%	5	60.0%
Francis Scott Key ES	75	36.0%	67	47.8%	10	40.0%
Francis T Evans ES	66	59.1%	47	78.7%	7	71.4%
Gaywood ES	65	21.5%	74	17.6%	9	44.4%
Gladys Noon Spellman ES	65	36.9%	91	36.3%	6	16.7%
Glassmanor ES	51	9.8%	33	3.0%	5	0.0%
Glenn Dale ES	87	43.7%	91	44.0%	14	21.4%
Glenridge ES	102	18.6%	97	47.4%	14	14.3%

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
Greenbelt ES	93	54.8%	98	54.1%	10	50.0%
High Bridge ES	49	32.7%	54	27.8%	7	42.9%
Highland Park ES	25	36.0%	29	62.1%	2	0.0%
Hillcrest Heights ES	87	26.4%	57	14.0%	6	50.0%
Hollywood ES	52	32.7%	68	29.4%	7	42.9%
Hyattsville ES	85	45.9%	84	38.1%	11	45.5%
Imagine Andrews PCS	45	73.3%	48	60.4%	8	62.5%
Imagine Foundations @ Leeland PCS	48	43.8%	51	33.3%	3	33.3%
Imagine Foundations @ Morningside PCS	49	14.3%	52	19.2%	6	16.7%
Imagine Lincoln PCS	43	55.8%	51	35.3%	5	80.0%
Indian Queen ES	41	56.1%	34	47.1%	5	40.0%
J Frank Dent ES	44	40.9%	35	22.9%	4	25.0%
James H Harrison ES	62	32.3%	36	27.8%	5	40.0%
James McHenry ES	132	25.0%	120	25.0%	14	0.0%
James Ryder Randall ES	44	45.5%	26	34.6%	5	20.0%
John H Bayne ES	49	30.6%	61	55.7%	7	0.0%
John Hanson French Immersion	90	34.4%	See Maya Angelou French Immersion			
John Hanson Montessori	51	68.6%	47	87.2%	8	62.5%
Judge Sylvania W. Woods, Sr. ES	92	15.2%	84	44.0%	12	33.3%
Judith P Hoyer Montessori	39	74.4%	43	93.0%	6	83.3%
Kenilworth ES	63	22.2%	41	46.3%	6	33.3%
Kenmoor ES	40	45.0%	N/A	N/A	N/A	N/A
Kettering ES	64	40.6%	67	44.8%	10	30.0%
Kingsford ES	72	44.4%	72	40.3%	6	33.3%
Lake Arbor ES	96	32.3%	98	51.0%	9	44.4%
Lamont ES	69	17.4%	77	26.0%	7	42.9%
Langley Park-McCormick ES	133	21.1%	135	32.6%	14	21.4%
Laurel ES	107	25.2%	87	19.5%	10	50.0%

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
Lewisdale ES	101	16.8%	96	17.7%	15	20.0%
Longfields ES	39	25.6%	45	17.8%	2	0.0%
Magnolia ES	68	42.6%	54	42.6%	8	37.5%
Marlton ES	33	45.5%	39	48.7%	7	42.9%
Mary Harris "Mother" Jones ES	170	24.1%	134	20.9%	17	5.9%
Mattaponi ES	35	60.0%	55	81.8%	6	50.0%
Maya Angelou French Immersion	See John Hanson French Immersion		89	41.6%	8	37.5%
Melwood ES	71	32.4%	60	63.3%	8	87.5%
Montpelier ES	107	42.1%	93	22.6%	10	20.0%
Mt Rainier ES	41	14.6%	37	48.6%	6	0.0%
North Forestville ES	41	19.5%	32	40.6%	4	50.0%
Northview ES	125	51.2%	93	49.5%	12	58.3%
Oaklands ES	86	8.1%	72	20.8%	7	28.6%
Overlook ES	79	30.4%	77	16.9%	7	85.7%
Oxon Hill ES	45	22.2%	32	28.1%	6	16.7%
Paint Branch ES	47	29.8%	46	32.6%	5	40.0%
Panorama ES	69	52.2%	96	34.4%	14	35.7%
Patuxent ES	63	46.0%	35	60.0%	3	0.0%
Perrywood ES	88	31.8%	102	33.3%	12	0.0%
Phyllis E Williams ES	86	50.0%	87	65.5%	10	50.0%
Pointer Ridge ES	50	72.0%	66	69.7%	4	75.0%
Port Towns ES	156	31.4%	165	22.4%	17	29.4%
Potomac Landing ES	70	38.6%	59	47.5%	6	33.3%
Princeton ES	57	22.8%	46	32.6%	6	33.3%
Ridgecrest ES	94	33.0%	95	17.9%	11	27.3%
Riverdale ES	106	7.5%	116	31.9%	15	26.7%
Robert Frost ES	50	50.0%	29	37.9%	3	33.3%
Robert Goddard French Immersion	99	63.6%	See Dora Kennedy French Immersion			

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
Robert Goddard Montessori	56	87.5%	58	84.5%	8	87.5%
Robert R Gray ES	60	56.7%	51	45.1%	9	44.4%
Rockledge ES	46	60.9%	54	37.0%	5	80.0%
Rogers Heights ES	132	20.5%	102	23.5%	11	18.2%
Rosa L Parks ES	110	20.0%	69	13.0%	11	18.2%
Rosaryville ES	55	36.4%	49	36.7%	7	71.4%
Rose Valley ES	47	40.4%	44	29.5%	5	60.0%
Samuel Chase ES	49	42.9%	34	58.8%	7	57.1%
Samuel P Massie Academy	41	43.9%	61	34.4%	5	20.0%
Scotchtown Hills ES	101	35.6%	90	32.2%	12	41.7%
Seabrook ES	27	22.2%	48	39.6%	6	0.0%
Seat Pleasant ES	29	24.1%	48	25.0%	5	40.0%
Skyline ES	20	30.0%	25	48.0%	N/A	N/A
Springhill Lake ES	151	22.5%	126	31.7%	18	22.2%
Suitland ES	58	19.0%	72	45.8%	11	9.1%
Tayac ES	54	42.6%	53	26.4%	7	14.3%
Templeton ES	129	25.6%	80	36.3%	11	9.1%
Thomas Claggett ES	22	18.2%	N/A	N/A	N/A	N/A
Thomas G Pullen	71	52.1%	68	58.8%	9	33.3%
Thomas S Stone ES	106	13.2%	110	6.4%	11	0.0%
Tulip Grove ES	55	50.9%	56	66.1%	6	83.3%
Turning Point Academy PCS	57	22.8%	58	20.7%	5	40.0%
University Park ES	94	52.1%	89	56.2%	9	44.4%
Valley View ES	47	42.6%	49	77.6%	5	40.0%
Vansville ES	112	40.2%	82	57.3%	13	15.4%
Waldon Woods ES	95	48.4%	92	47.8%	10	40.0%
Whitehall ES	86	57.0%	79	69.6%	11	63.6%
William Beanes ES	55	38.2%	67	49.3%	7	28.6%

	SY2015		SY2016		SY2017	
	N	% Ready	N	% Ready	N	% Ready
William Paca ES	64	29.7%	78	23.1%	15	33.3%
William W Hall Academy	59	55.9%	54	29.6%	6	0.0%
Woodmore ES	45	53.3%	32	78.1%	8	50.0%
Woodridge ES	42	11.9%	42	14.3%	5	20.0%
Yorktown ES	54	66.7%	49	69.4%	8	75.0%