A Review of Waterbury Kindergarten Entrance Inventory Data

Informing collective

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The opinions, findings, and recommendations expressed in this report are those of the authors and do not necessarily represent the positions or policies of the Leever Foundation or the Bridge to Success Partnership.

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Executive Summary

Overview

Children's early experiences are foundational to their future development, and research has linked children's readiness to begin school to future academic performance[1]. Improving the quality of pre-school and early school experiences can help to ensure that children are school ready and developmentally on target[2]. Similarly, identifying students who are at-risk developmentally and academically can help to guide necessary interventions.

Toward this end, this report reviews data generated from the Connecticut Kindergarten Entrance Inventory (KEI), which was administered to Waterbury kindergarten students during the fall of 2018-19 school year. During fall of 2018, Waterbury kindergarten students were assessed on the KEI inventory across six indicators (literacy, language, numeracy, creative, physical, personal). Students received a score ranging from 1 to 3 across each of the six indicators[3]. The higher the score, the more *school ready* a child was judged to be.

In the Spring of 2020, the Waterbury Public Schools (WPS) released aggregated KEI scores to Bridge to Success (BTS). The scores were cross tabulated by a range of socio-demographic factors; namely students' current school of attendance, pre-school experience, school readiness site attended prior to kindergarten, zip code of residence, and race/ethnicity. These data were then released to an external research team to identify trends associated with lower performance on the KEI. The research team also disaggregated the data to identify student groups that are more at-risk of not being school ready.

A total of 1,497 kindergarten students were assessed on the KEI. The majority of students who were Latinx (58%) followed by Black/African American (19%), White (17%), and Other (6%; e.g., Asian, Multi-racial, American Indian/Alaska Native). In addition,

[1] Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., & Sexton, H. (2007). School readiness and later achievement. *Developmental psychology*, *43*, 1428-1464

[2] While school readiness generally focuses on children's competencies and development, we rely on an expanded definition that also focuses on children's environments (e.g., schools) and their ability to support children's learning (e.g., Unicef. (2012). School readiness: A conceptual framework. United Nations Children's Fund: New York.)

[3] For more information about the KEI inventory please see the KEI Teacher Handbook; https://portal.ct.gov/-/media/SDE/Student-Assessment/K-Assessment/KEI-handbook.pdf?la=en

approximately 94% of students assessed resided within the following five zip codes (i.e., 06704, 06705, 06706, 06708, 06710)[4].

Overall, our review is consistent with national research findings indicating that students with no preschool experience are less likely to be school ready. In fact, based on our review, having no pre-k experience appears to be the strongest and most consistent factor linked to students not being school ready[5]. We also identified select schools and school readiness providers with a higher proportion of students who were not school ready, which can serve as the focus of collective impact strategies in Waterbury. Finally, some differences between racial/ethnic groups and zip codes were identified, which can be further explored to address issues concerning equity. However, these differences were sometimes inconsistent—at times varying across different outcomes of interest such as having attended a lower performing school readiness site, not having pre-k experience, or scoring at level one across the six KEI indicators. Taken together, the findings from this review offer insight into possible areas of focus to improve school readiness in Waterbury.

Recommendations

Our recommendations highlight focal areas that warrant investment (e.g., funding, programming) to promote school readiness in Waterbury. We stop short of overly prescriptive recommendations that delineate specific practices or programs, as any recommendation should be based on a careful review or need assessment of current programming across school readiness providers. Nevertheless, our review of the KEI data identifies some central areas that can be prioritized.

- **Expand access to quality school readiness sites:** Students who attended school readiness sites performed highest on the KEI inventory. Waterbury should expand children's access to high quality school readiness sites. Some possibilities can include expanding WPS school readiness sites, enhancing the quality of these sites, increasing attendance, and ensuring that more children have two years of school readiness experience.

[4] About 6% of students resided in zip codes outside of Waterbury.
[5] The findings in this report should be viewed as trends as they were not statistically tested. For example, while having no pre-k experience appears to be a significant factor linked to school readiness, this finding (along with other findings in this report) should be understood as a trend as it is based on aggregated data and was not statistically analyzed.

- **Outreach; connecting children to pre-k:** Students without pre-k experience, who did not attend a WPS or community site, performed lowest on the KEI inventory. Waterbury should promote community-based outreach strategies to ensure that more children have formal pre-k experience. In our review, Latinx students comprised the majority of students without school readiness experience. Community outreach efforts should continue to be conducted in non-traditional settings (e.g., churches) and incorporate culturally appropriate strategies (e.g., use of bilingual bicultural outreach workers).

- **Target school readiness providers yielding low performing students:** Some school readiness providers yielded a higher proportion of students that scored low on the KEI inventory. These sites can be prioritized as target sites that can receive additional support by way of resources (e.g., funding, staffing, professional development) and programming[6]. Waterbury can convene community stakeholders (e.g., funders, practitioners, school officials, classroom teachers, and parents) to develop an action plan that mobilizes resources toward these sites. Stakeholders should develop district-wide and building-specific strategies to address common challenges as well as challenges that are unique to specific sites (e.g., non-native English learners, poverty, trauma).

- **Target schools with a higher proportion of low-performing students:** Some schools account for a higher proportion of students that perform low on the KEI inventory. These schools should be prioritized to receive additional and focused support.

- **Screening:** We strongly encourage the use of validated screening instruments. Given that social-emotional (e.g., self-regulation) and language/literacy skills are the strongest developmental predictors of school readiness, screening instruments should be selected to assess these areas. For example, children who experience trauma or adverse childhood experiences may not be fully ready to learn and this should be assessed to inform appropriate interventions.

- **Data & evidence-informed practices:** Waterbury should continue the use of data-driven strategies. We encourage the review of de-identified student-level data (as opposed to aggregated data) consisting of validated screening instruments, attendance information, and demographic data. Ideally, these data should be available in real time to guide evidence-based school readiness strategies within the same school year.

[6] We strongly suggest that such sites should be supported, and caution should be taken to ensure that such sites are not stigmatized or penalized in any way.

- **Equity:** Students from certain racial/ethnic backgrounds and who lived in certain zip codes were less likely to be school ready. These disparities should be further explored to inform school readiness strategies. Some possibilities include a closer examination of where school readiness sites are located, which can provide insight into school readiness access. Other possibilities include further examining why students from some racial/ethnic groups are more likely to attend lower performing school readiness sites. Ideally, such reviews should be performed with relatively current data.

Section 1
KEI Performance

In this section, we provide a comprehensive overview of kindergarten entrance inventory (KEI) performance data across five socio-demographic factors; 1) pre-k experience, 2) type of school readiness provider, 3) gender, 4) race/ethnicity, and 5) zip code. The tables in this section offer a broad understanding of how socio-demographic characteristics intersect with school readiness. This information can be used by community stakeholders and practitioners as a first step toward developing school readiness strategies.

School readiness & social-demographic factors

Are some groups of students less likely to be school ready?

Some groups of students are less likely to be school ready. We reviewed five socio-demographic characteristics to identify groups that are more likely to perform at level. To understand if one group of students (e.g., Latinx students) is more likely to perform at level one in comparison to another group (e.g., White students), one must account for the total number of students in each group. For example, this requires dividing the total number of Latinx students scoring at level one by the total number of Latinx students. This calculation is then repeated for other groups so that proportions can be compared. Ultimately, such comparisons between groups of students can offer insight into disproportionality and equity. Tables 1a and 1b provide a general overview of KEI performance across different socio-demographic factors. According to tables 1a and 1b, the following patterns should be noted.

- Pre-k Experience: Having no pre-k experience appears to be the socio-demographic characteristic most strongly and consistently associated with *not* being school ready. Students without pre-k experience are at higher risk of scoring at level one as compared to students with pre-k experience. Students with no pre-k experience are also less likely to perform at level three, the highest performance level on the KEI. In fact, students without pre-k experience are about 50% more likely to perform at level one in language and literacy than students with pre-k experience (table 1a). It is also worth noting that the largest disparities in school readiness are between students with no pre-k experience and students who attended a school readiness site within the Waterbury Public Schools.

Finally, it should also be noted that a significant proportion of students still perform at level one despite having school readiness experience (e.g., 28% and 29% of students with pre-k experience score at level one in language and literacy, respectively).

- Gender: Male students were less likely than female students to be school ready, particularly within the KEI language and personal domains.

- Race/ethnicity: Latinx and Black/African American students are at higher risk of scoring at level one than their White counterparts. However, these disparities do not appear to be as wide as the discrepancies between students with and without pre-k experience. It is also important to note that a relatively high proportion of students across all racial/ethnic groups score at level one.

  Zip code: Students in zip code 06706 appear to be at highest risk of not being school ready whereas students in zip code 06710 appear to be least at risk. Approximately 66% of Latinx students live in zip code 06706 even though Latinx students comprise 58% of the students who were assessed (see Figure 1). In contrast, Black students were less likely to live in zip code 06706 and were more likely to reside in 06710 relative to their population (Figures 1 and 2). Despite the differences, the clustering of low-performing students is not necessarily specific to any one zip code. Rather, high proportions of low-performing students were found across multiple Waterbury zip codes.

Table 1a:
KEI performance across socio-demographic factors
Interpreting this table: Table 1a shows the percent of students across each socio-demographic characteristic who perform at either level-1, level-2, or level-3. For example, out of a total of 277 Black students, 36% (N=100) perform at level one in language. Differences in this table should be interpreted as trends and not as statistically significant differences.

	Language			Literacy			Personal			Total in row
Socio-demographic Characteristics	L1** %	L2 %	L3 %	L1 %	L2 %	L3 %	L1 %	L2 %	L3 %	
Pre-K Experience										
Pre-K	28%	40%	32%	29%	43%	28%	24%	41%	35%	831
No Pre-K	**42%**	36%	22%	**44%**	37%	19%	**33%**	41%	26%	666
Pre-K Type										
WPS Site	26%	38%	36%	25%	44%	32%	23%	38%	39%	472
Community Site	30%	42%	28%	34%	43%	23%	26%	45%	29%	359
No Pre-K	**42%**	36%	22%	**44%**	37%	19%	**33%**	41%	26%	666
Gender										
Female	30%	40%	31%	34%	41%	26%	23%	43%	35%	676
Male	**38%**	37%	25%	37%	41%	22%	**33%**	40%	28%	821
Race/Ethnicity*										
Latinx	**36%**	37%	27%	**37%**	39%	23%	**29%**	40%	31%	875
Black/AA	**36%**	37%	27%	**37%**	38%	25%	**29%**	43%	29%	277
White	28%	42%	30%	29%	46%	26%	24%	41%	35%	250
Zip Code*										
06704	**38%**	34%	28%	39%	35%	26%	29%	38%	34%	402
06705	31%	39%	30%	32%	45%	23%	25%	41%	35%	313
06706	37%	42%	*22%*	**42%**	36%	23%	**31%**	42%	27%	217
06708	37%	38%	26%	34%	43%	23%	**31%**	45%	24%	326
06710	*29%*	39%	*33%*	*31%*	41%	*29%*	*27%*	41%	32%	144

Note: Underlined and italicized values consist of lower numbers of students and should be interpreted with some caution. *Asian & multi-racial students and some zip codes not included due to low numbers. **L1= Level one etc.

Table 1b:

KEI performance across socio-demographic factors

Interpreting this table: Table 1b shows the percent of students across each socio-demographic characteristic who perform at either level one, level-2, or level-3. For example, out of 875 Latinx students, 38% perform at level one in numeracy. Differences in this table should be interpreted as trends and not as statistically significant differences.

	Numeracy			Physical			Creative			Total in row
Socio-demographic Characteristics	**L1 %	L2 %	L3 %	L1 %	L2 %	L3 %	L1 %	L2 %	L3 %	
Pre-K Experience										
Pre-K	29%	44%	27%	17%	45%	37%	20%	44%	36%	831
No Pre-K	**42%**	39%	19%	**25%**	44%	31%	**28%**	44%	29%	666
Pre-K Type										
WPS Site	24%	46%	30%	15%	45%	40%	18%	42%	40%	472
Community Site	35%	43%	22%	20%	46%	34%	21%	48%	32%	359
No Pre-K	**42%**	39%	19%	**25%**	44%	31%	**28%**	44%	29%	666
Gender										
Female	33%	43%	25%	19%	44%	37%	19%	43%	37%	676
Male	36%	42%	22%	22%	45%	33%	26%	44%	30%	821
Race/Ethnicity*										
Latinx	**38%**	39%	23%	20%	45%	35%	**24%**	43%	33%	875
Black/AA	**34%**	43%	23%	24%	44%	33%	**24%**	43%	33%	277
White	26%	50%	23%	20%	44%	36%	19%	46%	34%	250
Zip Code *										
06704	39%	33%	28%	20%	41%	40%	23%	38%	39%	402
06705	30%	47%	23%	20%	46%	33%	22%	43%	35%	313
06706	**41%**	37%	*22%*	**26%**	48%	26%	**27%**	48%	26%	217
06708	35%	46%	19%	23%	47%	30%	26%	50%	25%	326
06710	*28%*	45%	*27%*	*12%*	50%	38%	*15%*	50%	35%	144

Note: Underlined and italicized values consist of a low number of students and should be interpreted with some caution. *Asian & multi-racial students and some zip codes not included due to low numbers. **L1=Level one etc.

Figure 1: Racial/ethnic breakdown of students in 06706 relative to the population

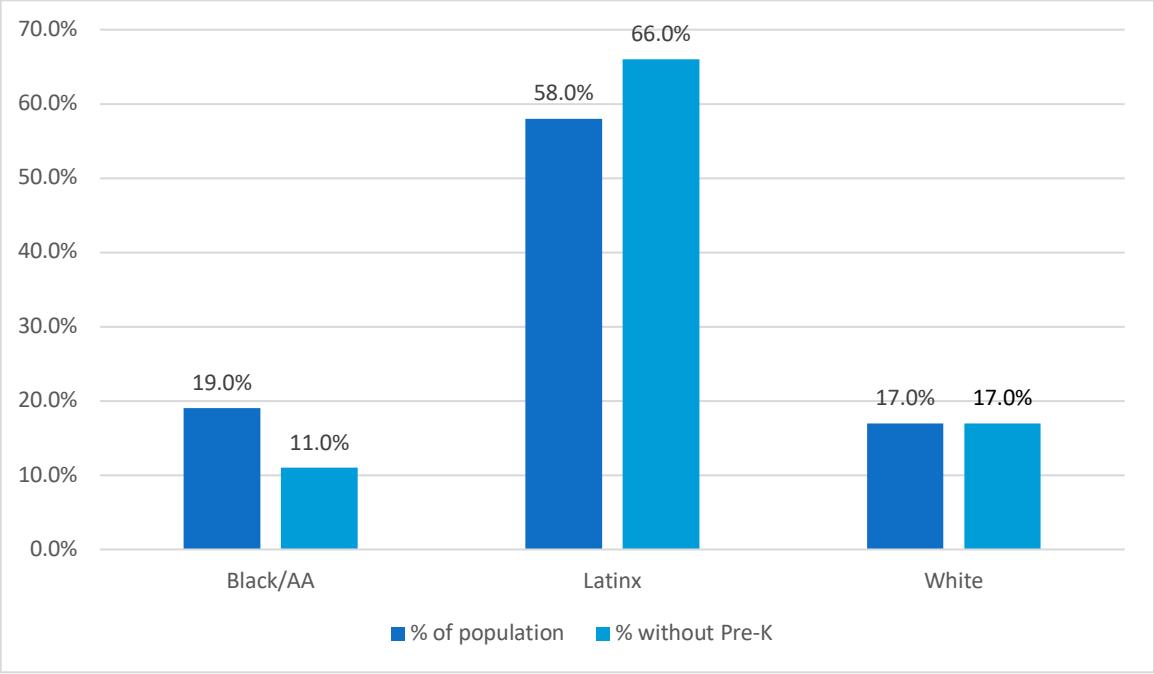
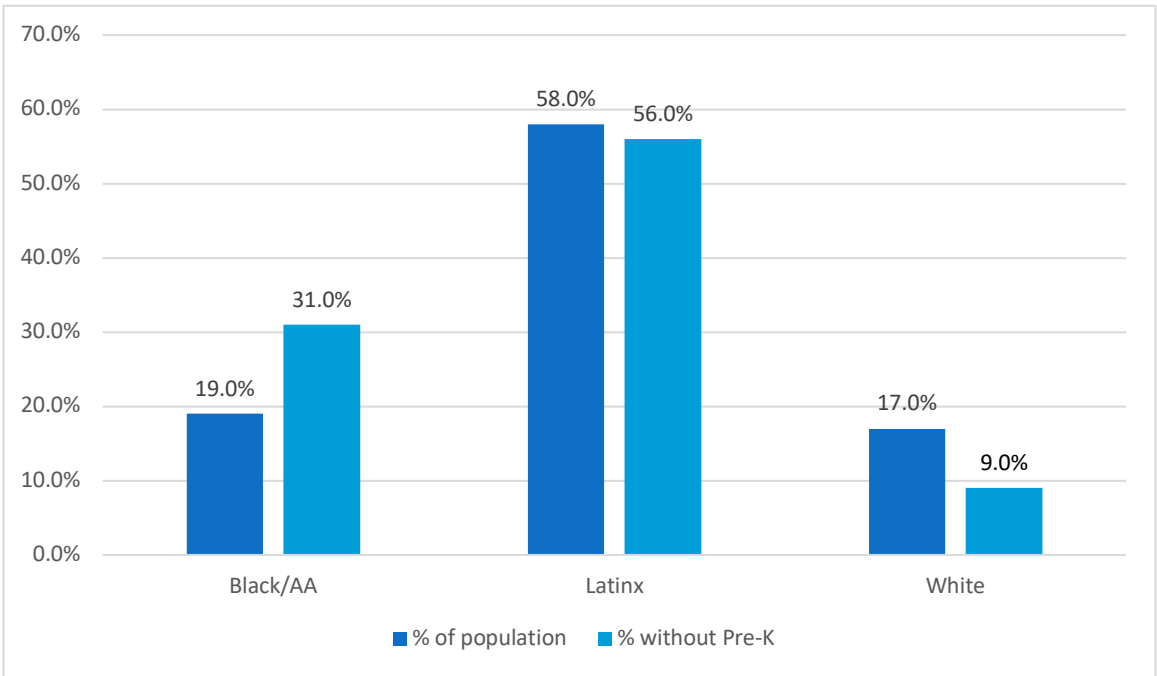


Figure 2: Racial/ethnic breakdown of students in 06710 relative to the population



Section 2

KEI scores by school & provider

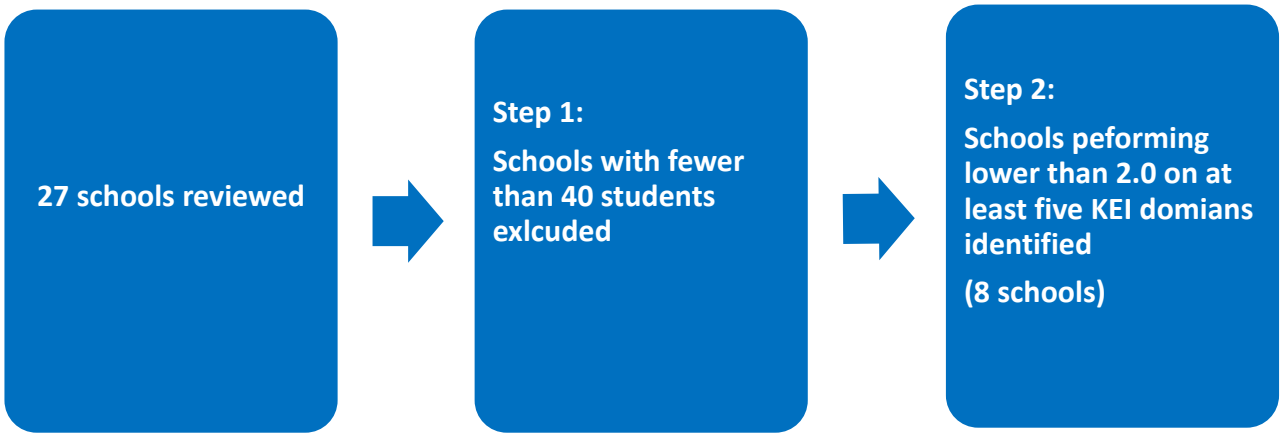
In this section, we identify schools and school readiness sites that perform lower (i.e., level one) on the KEI inventory and can benefit from strategic interventions. Identifying schools and providers with a higher concentration of students that are not school ready can inform targeted school and site-specific strategies.

Target schools

Which schools have more students that are not school ready?

We reviewed 27 schools based on their average KEI inventory score in order to identify schools in which the average student is not school ready. Schools with fewer than 40 students were excluded from this review. Next, we identified schools that scored below an average of 2.0 on at least five of the six KEI indicators (Literacy, Language, Numeracy, Physical, Creative, Personal). In other words, schools that scored less than 2.0 have students that, on average, score at level one. This process resulted in eight *target schools*.

Process for selecting target schools



These eight *target schools* generally serve a moderate to high number of students, in which the average student scores low across multiple KEI performance areas. In addition to low average scores, these schools also tend to have a higher proportion of students scoring at level one. For example, 57% of the kindergarten students that were assessed at B.W. Tinker school performed at level one in language.

Importantly, some schools differ substantially in terms of school readiness, but have a similar number of students. For example, H.S. Chase and B.W. Tinker school both have approximately 100 students. Despite having a similar number of students, B.W. Tinker students, on average, scored at the lowest performance level (level one) across six KEI domains whereas students at H.S. Chase scored more favorably. In fact, only 13% and 14% of kindergarten students who were assessed at H.S. Chase perform at level one in language and literacy, respectively, as compared to 57% and 53% at B. W. Tinker school. While the data we reviewed are insufficient in explaining why these disparities exist[7], these differences in scores raise questions about some of the factors driving these disparities. For example, these schools may serve students from different neighborhoods, may have different class sizes, or may draw students with different levels of pre-k experience.

A focused investment in resources, programing, and other supports that target kindergarten students at these target schools may help to promote school readiness efforts in Waterbury. Given that children's language/literacy and social-emotional development are the strongest predictors of school readiness, these areas should also be prioritized.

[7] For example, we did not receive disaggregated data for schools.

Table 2: Average KEI score and proportion of students that are not school ready by school

School Name	Average KEI score								Not School Ready: % of students at level-1					
	Total Students	Lang	Lit	Num	Phys	Crea	Pers	Domains less than 2.0 **	Lang	Lit	Num	Phys	Crea	Pers
H.S. Chase	98	2.39	2.20	2.27	2.64	2.58	2.60	0	13%	14%	11%	1%	2%	2%
B.W. Tinker*	98	1.53	1.56	1.48	1.59	1.60	1.60	6	57%	53%	58%	51%	50%	53%
Margaret M.* Generali	96	1.60	1.61	1.65	1.64	1.68	1.69	6	46%	45%	41%	38%	38%	42%
Bunker Hill	93	1.78	1.81	1.77	2.20	2.00	1.96	4	41%	39%	38%	20%	27%	29%
Rotella Interdistrict	89	2.13	2.06	2.01	2.24	2.21	2.12	0	19%	20%	16%	15%	14%	19%
Woodrow Wilson*	83	1.77	1.70	1.67	2.10	1.99	1.88	5	41%	45%	47%	18%	25%	28%
Driggs School	83	1.94	1.83	1.93	2.08	2.07	1.86	4	33%	36%	27%	12%	11%	33%
Maloney Interdistrict	80	2.30	2.16	2.18	2.69	2.71	2.60	0	15%	9%	10%	3%	1%	8%
F.J. Kingsbury	80	2.45	2.50	2.49	2.73	2.75	2.61	0	13%	13%	15%	5%	4%	6%
Hopeville	77	1.96	1.95	1.96	2.14	2.03	2.08	3	26%	30%	39%	13%	22%	20%
Bucks Hill	71	1.97	1.99	2.03	2.24	2.21	2.01	2	38%	34%	38%	23%	24%	32%
Sprague	69	2.10	2.06	2.12	2.28	2.36	2.17	0	19%	20%	19%	13%	10%	15%
Wendell L. Cross	59	2.14	2.02	2.07	2.20	2.32	2.29	0	20%	27%	25%	5%	2%	3%
Walsh*	57	1.65	1.35	1.37	1.82	1.79	1.75	6	54%	75%	70%	51%	56%	56%
Washington	55	2.05	2.13	2.13	2.33	2.33	2.29	0	27%	27%	26%	11%	9%	16%
Duggan*	54	1.70	1.76	1.69	1.83	1.65	1.74	6	46%	43%	44%	32%	46%	37%
Carington*	48	2.25	2.29	2.15	2.42	2.31	2.25	0	15%	13%	21%	4%	6%	17%
Gilmartin*	44	1.23	1.16	1.14	1.11	1.14	1.16	6	77%	84%	86%	89%	86%	84%
Reed*	41	1.34	1.34	1.29	1.83	1.73	1.71	6	66%	66%	70%	17%	27%	32%

*Denotes a target school. **Total number of KEI domains in which average is below 2.0
Note: Lang=Language; Lit=Literacy; Num=Numeracy; Phys=Physical; Crea=Creative; Pers=Personal

Target providers

Next, we examined student performance on the KEI across school readiness providers—the school readiness sites that kindergarten students attended prior to kindergarten. Specifically, we examined the proportion of kindergarten students who performed at level one across each school readiness provider site[8].

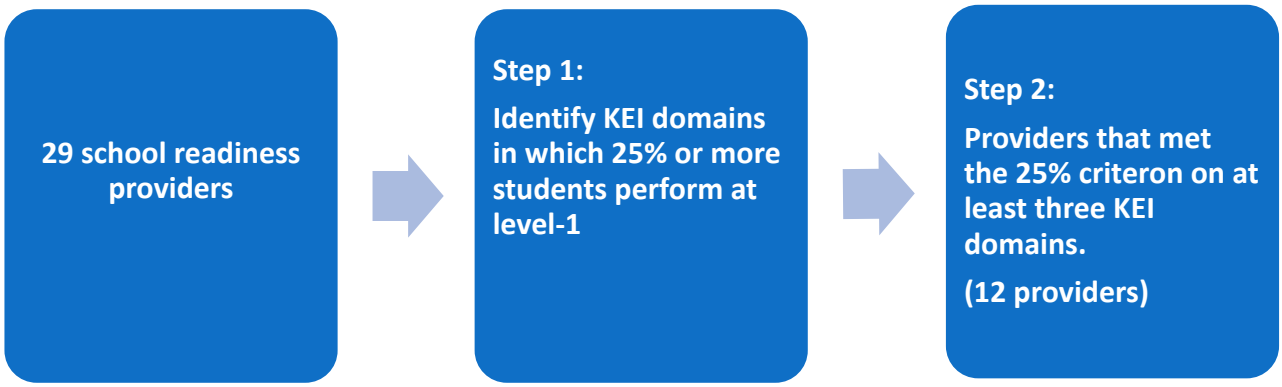
Overall, some school readiness providers yielded a higher proportion of students who score at level one in kindergarten. For example, nearly 40% of kindergarten students who attended New Opportunities performed at level one in language. In contrast, school readiness providers such as Maloney and Sprague, which also serve a large number of students, yielded fewer students performing at level one in literacy (17% and 15%, respectively).

Which school readiness sites yield more students that are not school ready?[9].

We used a two-step process to identify school readiness providers that yielded a higher proportion of students that are not school ready and may need additional support. First, we identified KEI domains in which 25% of the students or more scored at performance level one. Second, we identified providers that met this 25% criterion on at least three domains. For purposes of this section, we refer to these as *target providers,* which can serve as the basis of targeted strategies.

[8] The total number of WPS kindergarten students scoring at level one who attended a specific school readiness provider site was divided by the total number of students assessed who attended the same site.
[9] Note: while comparisons can be made across sites, we advise for such comparisons to not be used as an indicator of a provider's performance or operations.

Process for selecting target providers



As shown in Table 6, we identified twelve target providers (out of 29 school readiness providers in total). However, we suggest prioritizing sites that meet these criteria and that also serve a higher number of students such as YMCA, New Opportunities, and Wilson. Focusing on sites serving a higher number of students can address issues concerning equity while simultaneously promoting school readiness for a large volume of students. Any effort seeking to improve school readiness will need to target a high volume of students.

Importantly, we advise caution in inferring that deficits in programming or operations at these sites are responsible for students performing low of the KEI when they enter kindergarten. Rather, it is possible that at least some of these school readiness providers may be more likely to serve students who are living in poverty, English language learners, immigrant and trauma-exposed children, or a combination of these factors. A possible next step is to conduct need assessments of these sites, which can help to inform the types of resources and interventions needed to promote school readiness. This also points to the importance of using a validated screening tool that can be integrated into such need assessments.

Table 4: Percent of students that are not school ready by provider (performance at level one)

Provider	Lang. % scoring at L1	Lit. % scoring at L1	Num. % scoring at L1	Phys. % scoring at L1	Creat. % scoring at L1	Pers. % scoring at L1	Number of areas above 25%	Total Students
YMCA	26%	27%	31%	17%	10%	21%	3*	78
New Opportunities	39%	44%	44%	24%	24%	33%	4*	70
Maloney	17%	14%	14%	10%	9%	13%	0	69
Sprague	15%	12%	12%	6%	10%	13%	0	67
Wilson	31%	33%	31%	13%	22%	18%	3*	55
Rotella	23%	19%	17%	17%	15%	23%	0	47
Easter Seals C.A. East	18%	18%	18%	15%	13%	13%	0	39
TEAM	34%	37%	40%	17%	26%	29%	5	35
Children's Center G.W.	31%	38%	38%	31%	28%	31%	6	32
Carrington	23%	17%	20%	17%	20%	23%	0	30
Bucks Hill Annex	36%	29%	29%	18%	18%	36%	4	28
ARK	25%	32%	29%	11%	14%	21%	3	28
Duggan	33%	30%	26%	19%	26%	30%	5	27
W. Cross	12%	28%	20%	8%	8%	8%	1	25
Gilmartin	54%	58%	63%	67%	58%	58%	6	24
Reed	52%	48%	48%	9%	17%	26%	4	23
Easter Seals C.A. West	30%	39%	44%	22%	22%	26%	4	23

*Although target sites are identified, we suggest prioritizing sites that serve a higher number of students (e.g., YMCA, New Opportunities, Wilson). Note: Lang=Language; Lit=Literacy; Num=Numeracy; Phys=Physical; Crea=Creative; Pers=Personal

Are some racial/ethnic groups more likely to attend the lower performing school readiness target sites?

Finally, we examined the racial/ethnic breakdown within target and non-target provider sites relative to the racial/ethnic composition of all 1,497 students who were assessed. The proportion of students within any racial/ethnic group who attended the lower performing target sites should generally be similar to the proportion of students of the same racial/ethnic group who were assessed.

As shown in Figure 3, Latinx students appear to be disproportionately represented among the lower performing target providers as they make up nearly 70% of the students across these sites despite comprising 58% of the student body who were assessed (see Figure 3). However, the percent of Latinx students at higher performing *non-target sites* is proportionate to the total population of Latinx students who were assessed (Figure 4). In contrast, White students were less likely to attend the 12 target sites and were instead more likely to attend school readiness sites yielding higher performing students (see Figures 3 and 4).

Figure 3: Racial/ethnic composition of lower performing sites relative to the population

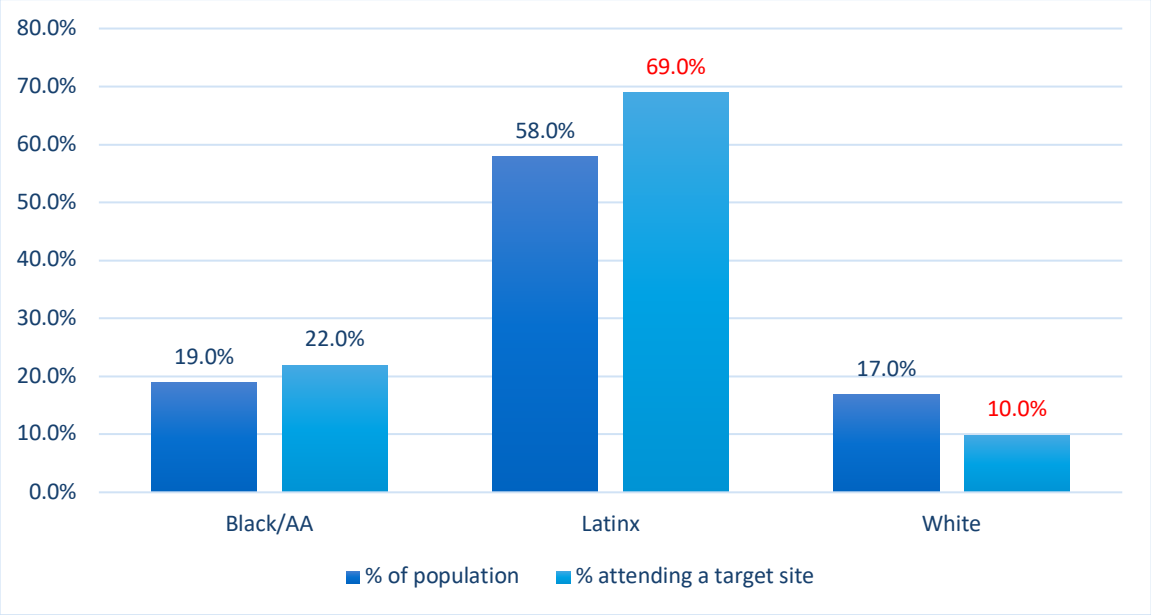
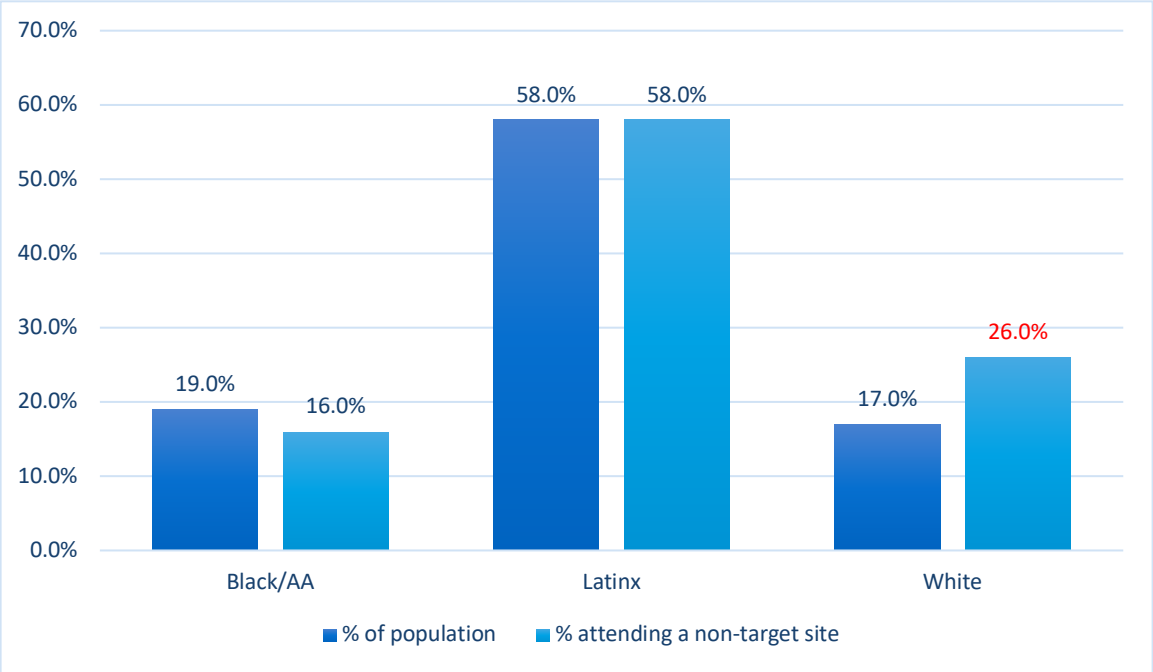


Figure 4: Racial/ethnic composition of higher performing sites relative to the population



Section 3

Disaggregated data

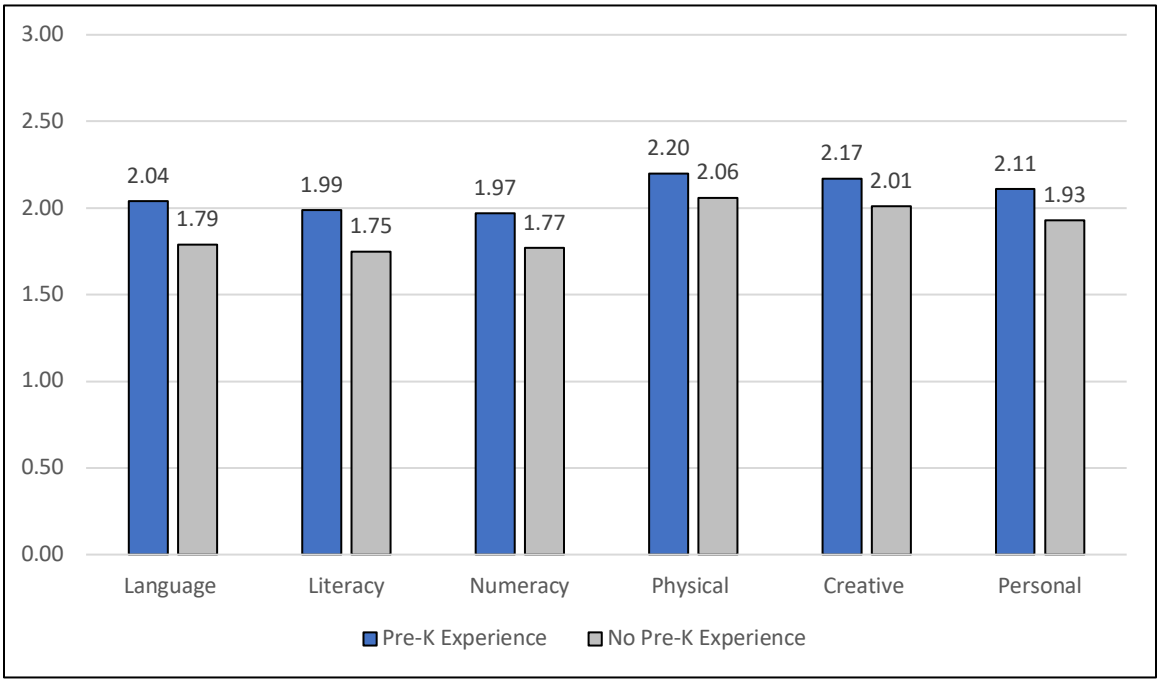
This section disaggregates school readiness data and offers a more nuanced view of pre-k experience and school readiness performance. First, we provide a broad overview by comparing the KEI scores between kindergarten students who did and did not attend a school readiness site (N=666; N=831). Second, we compare scores among students who attended a WPS school readiness site, Community Site, or neither[10]. Finally, we disaggregate school readiness data according to socio-demographic factors, namely race/ethnicity and zip code. Specifically, we disaggregate data to better understand students who do not have pre-k experience and who perform at level one, respectively.

KEI scores by school readiness experience

As noted earlier in this report, students without school readiness experience performed lower on the KEI inventory. This pattern is consistent across all six KEI indicators (see Figure 5). Waterbury stakeholders may need to explore ways to ensure that a higher volume of children receive school readiness experience. This can include expanding the number of accessible neighborhood-based school readiness sites in Waterbury, while simultaneously enhancing the quality of existing sites. Another possibility is to ensure that more students receive two years of school readiness experience, as opposed to one year.

[10] KEI scores are compared between students who attended a Waterbury school readiness site (either within the Waterbury Public Schools or a community site) and students who did not attend a school readiness site. However, this may not necessarily mean that students did not attend pre-school or a school-readiness program in another municipality.

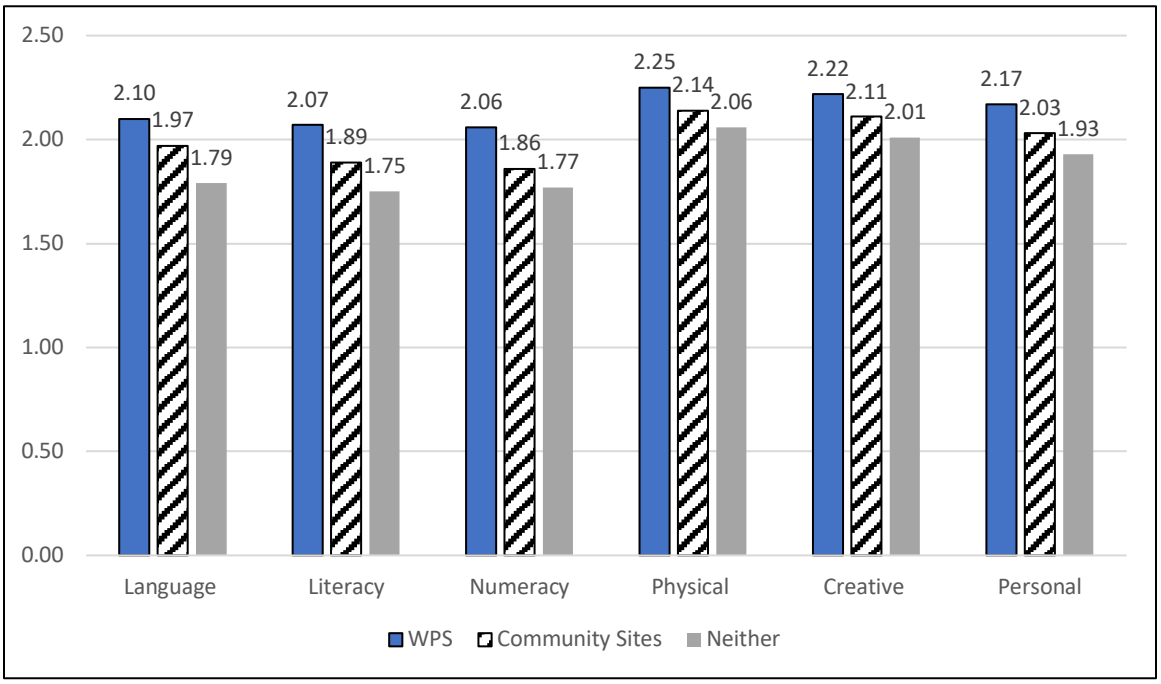
Figure 5: Average KEI scores by pre-k experience



KEI scores by type of school-readiness site

Students who attended WPS school readiness sites, on average, appear to perform highest on the KEI (Figure 6). Further, students who attended community sites performed lower than students who attended WPS sites, but still performed better than students who attended neither (WPS or community site). Kindergarten students who attended neither a WPS or community school readiness site performed lowest on the KEI inventory and are in greatest need of instructional support. However, as previously stated in this report, these differences should be viewed as trends and indicative of statistical differences.

Figure 6: Average KEI scores by type of school readiness site



Disaggregation of pre-k experience data

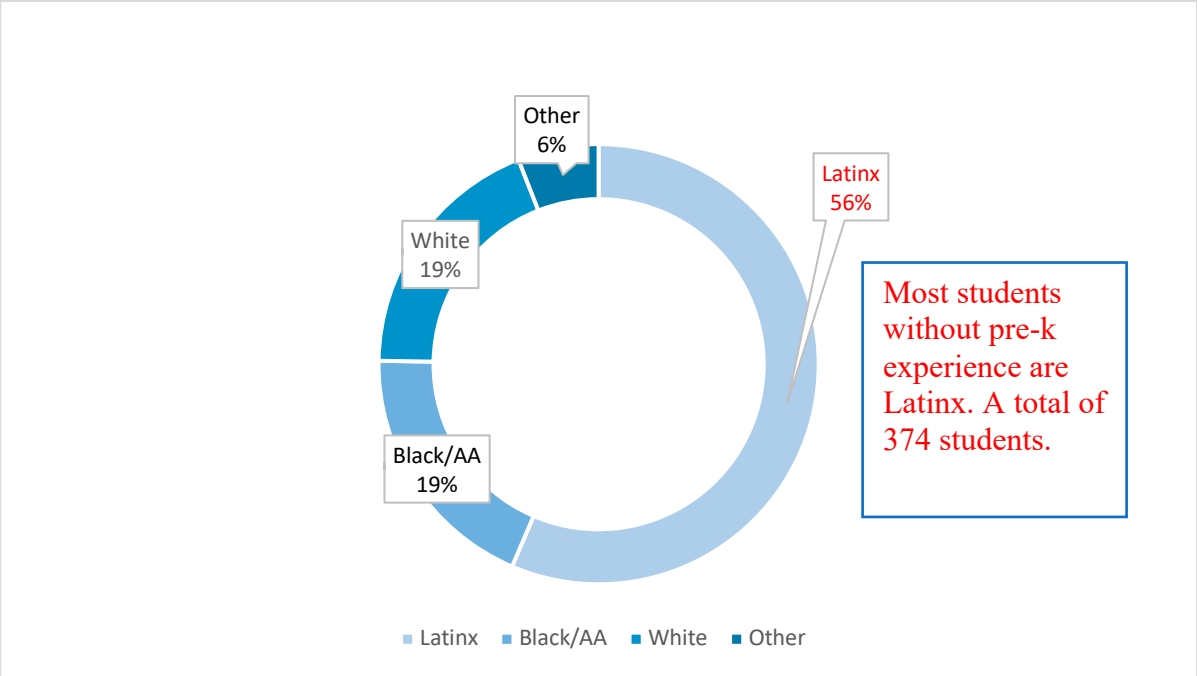
As previously discussed, students with pre-k experience perform higher than students without pre-k experience. We disaggregated school readiness data according to other socio-demographic factors, namely race/ethnicity and zip code. In doing so, we used two metrics, *composition* and *disproportionality*. We were interested in understanding both the *composition* of students without pre-k experience and whether some groups are more or less likely to have pre-k experience, such as students from specific racial/ethnic groups or students who live in a specific zip code.

Which racial/ethnic groups make up the majority of students without pre-k experience?

Composition: Composition tells us the percentage of children within a category (e.g., students without pre-k experience) who are from a specific racial or ethnic group. For example, out of all students who did not have school readiness experience, the majority, were Latinx (56%; Figure 7), followed by Black/African American students (19%). However, this is due to a higher number of Latinx students being assessed (N=875). Nevertheless, given that Latinx students comprise most of the students without pre-k experience, any effort to promote school readiness access will need to integrate culturally-appropriate strategies. For

example, such strategies can consist of outreach in non-traditional settings (e.g., churches) and targeted outreach to hard-to-reach populations such as immigrant families using outreach workers from the Waterbury community.

Figure 7: Students without pre-k experiences by race/ethnicity



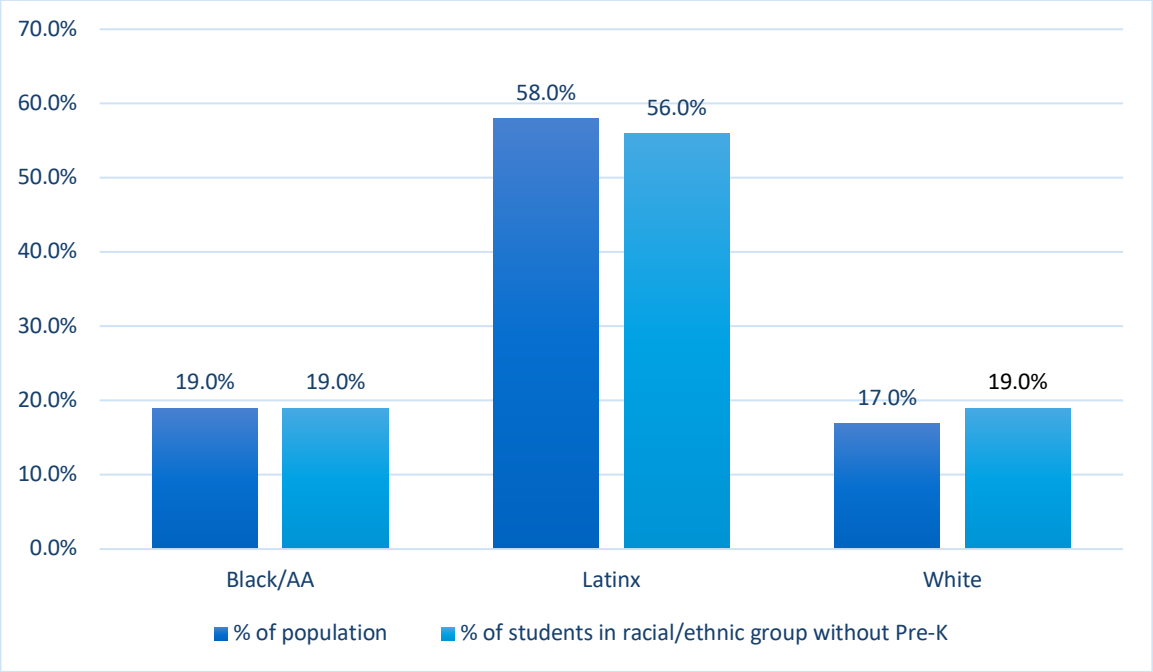
Which racial/ethnic groups are disproportionality represented among students without pre-k experience?

Disproportionality: While composition can tell us about the racial/ethnic breakdown of students without pre-k experience (described above), it does not necessarily yield information about disproportionality. Instead, *disproportionality* is a metric that can answer questions about whether certain groups of students are over-represented or more likely to experience a certain outcome such as having no pre-k experience.

Disproportionality relative to total population: First, we compared the percent of students without pre-k experience across each racial/ethnic group to the total population of students from the same racial/ethnic group (Figure 8). In other words, we examined if students from certain racial/ethnic groups were disproportionately represented among students without pre-k experience by comparing to the size of the racial/ethnic group.

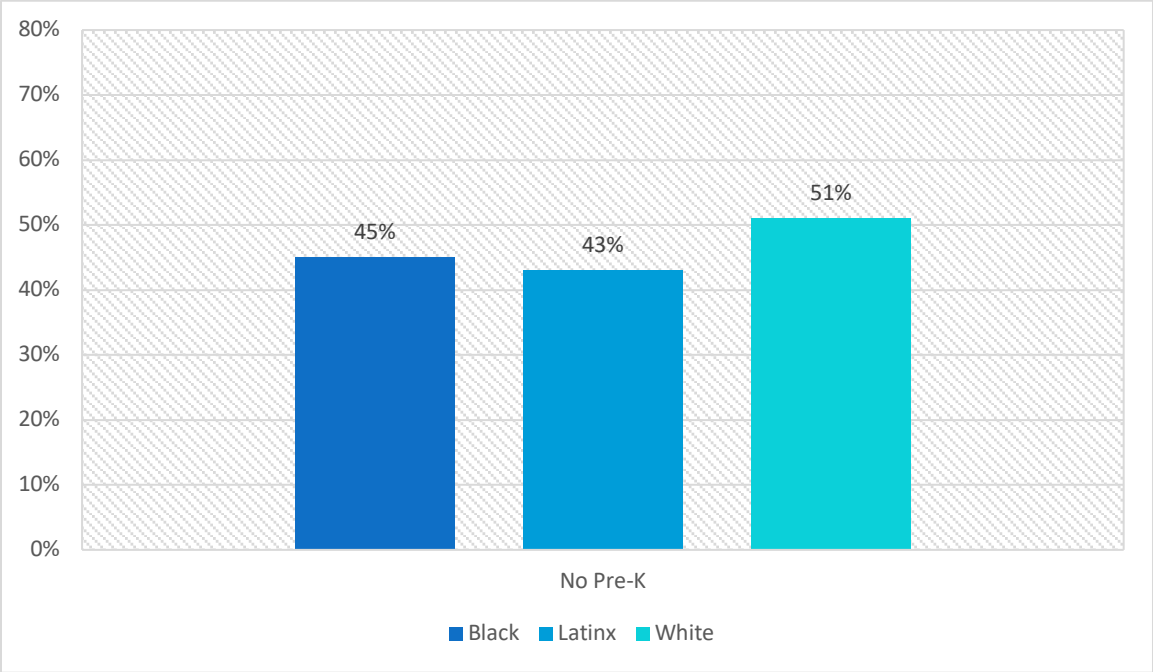
As shown in Figure 8, Latinx students account for 56% of students without pre-k experience, but also account for 58% of the population of students who were assessed on the KEI. In other words, the percent of Latinx students without pre-k experience is proportional to its group size or the total population of Latinx students who were assessed on the KEI.

Figure 8: No pre-k experience by race/ethnicity relative to the population



Disproportionality between groups: Finally, we examined if students from specific racial/ethnic groups were less likely to have pre-k experience relative to students from other racial/ethnic groups. Assessing disproportionality in this fashion can tell us if certain groups are more at-risk of having no school readiness experience (e.g., Black students as compared to White students). As illustrated in Figure 9, the risk of having no school readiness experience is similar across Black/African American, Latinx, and White students — though the widest disparity is between Latinx and White students. For example, White students who were assessed in kindergarten were more likely to not have school-readiness experience (51%) as compared to Latinx students (43%).

Figure 8: Risk of not having pre-k experience by race/ethnicity

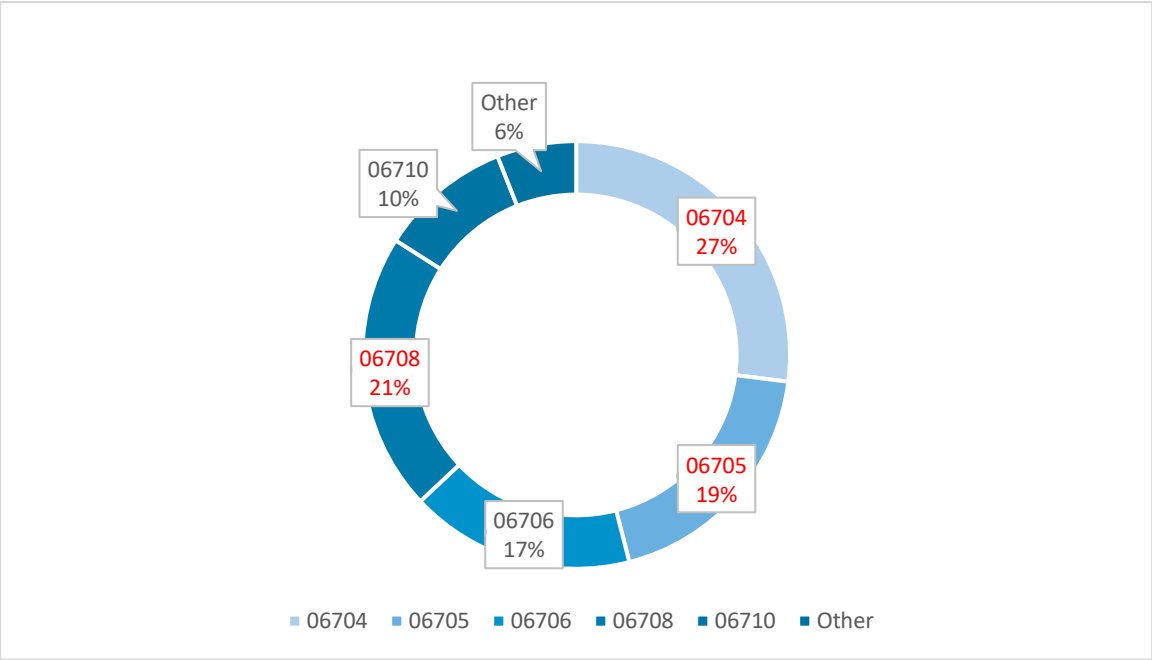


Where do students without pre-k experience live?

Composition:[11] Overall, most of the students who entered kindergarten without pre-school experience (67%) live in zip codes 06704, 06705, and 06708, mainly because a higher number of students who were assessed reside in these three zip codes. It may be worth examining the extent to which school readiness sites are available in these zip codes.

[11] As stated earlier in this report, composition tells us the percentage of children within a category (e.g., students without pre-k experience) who are from a specific racial/ethnic group.

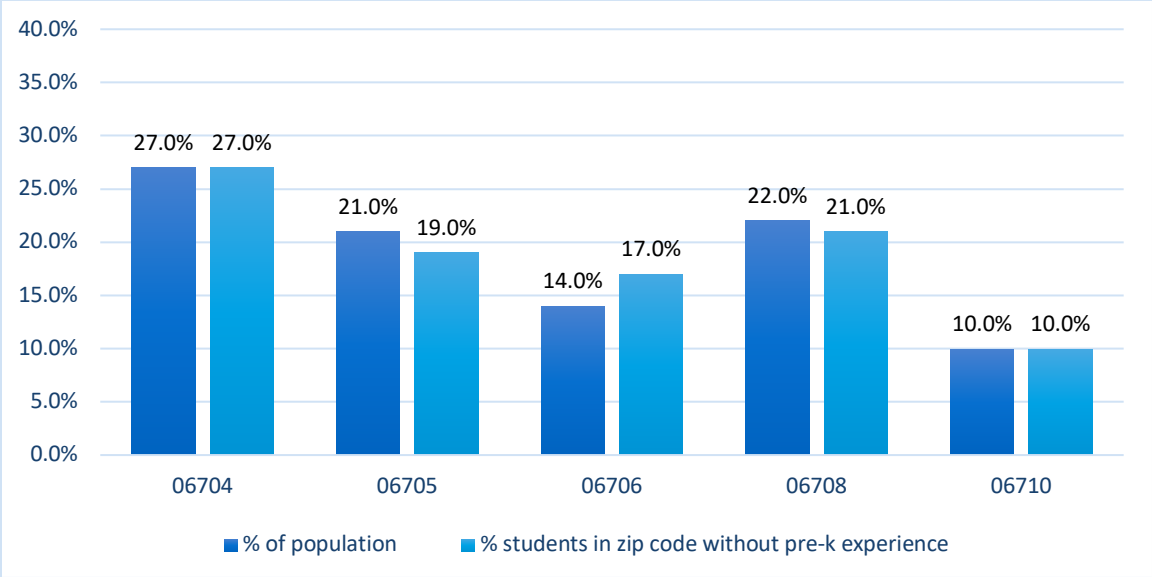
Figure 9: Students without pre-school experience by zip code



Which zip codes are disproportionality represented among students without pre-k experience?

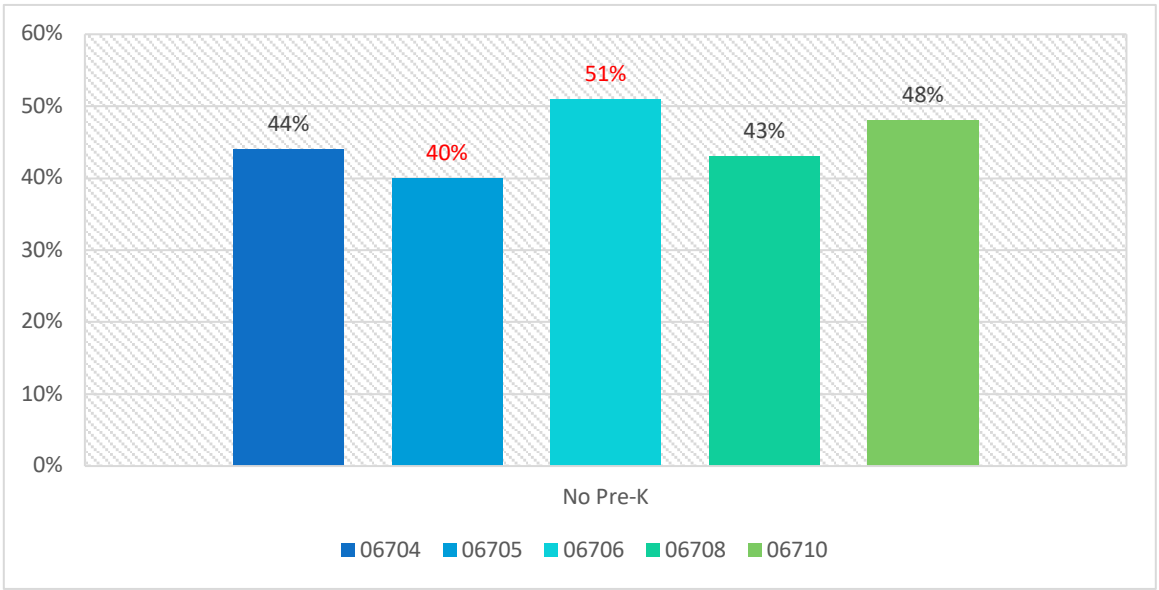
Disproportionality relative to the population: In general, across each zip code, the percent of students without pre-k experience appears to be proportional to the total population of students assessed from each zip code. For example, 06704 accounts for 27% of the students who did not have pre-k experience, but also makes up 27% of all the children who were assessed.

Figure 10: No pre-k experience by zip code relative to the population



Disproportionality between groups: Finally, we examined if students from certain zip codes were less likely to have pre-k experience relative to students who live in other zip codes. As shown in Figure 11, students living in zip code 06706 were most likely to not have pre-k experience. Comparatively, students residing in 06705 appear to be least at risk of not having pre-k experience (40%), though this proportion is also concerning. As stated earlier in this section, it may be worth examining the extent to which school readiness sites are available across these zip codes.

Figure 11: Risk of not having pre-k experience across zip codes



Disaggregation of KEI performance (level one)

Students who perform at level one on the KEI are the least school ready and in need of instructional support. We reviewed KEI performance at level one across students 1) with school readiness experience and 2) without school readiness experience. We then disaggregated level one performance by race/ethnicity and by zip code. Disaggregating the data in this fashion can help to identify socio-demographic factors associated with a higher risk of not being school ready. We also repeated this analysis for students who performed at level three.

Are students from certain racial/ethnic groups less likely to be school ready? How do these racial/ethnic differences hold when students do or do not have pre-k experience?

Regarding pre-k experience, White students appear to be at lower risk of scoring at level one as compared to Latinx and Black/African American students (Table 5).[12] The disparities in level one performance appear to hold more strongly among students with pre-k experience. For example, 10% of White students performed at level one in language as compared to 21% of Black/African American students. In contrast, the proportion of students performing at level one among students without pre-k experience appears to be similar across racial/ethnic groups.

Are students who live in certain zip codes less likely to be school ready? How do these differences hold when students do or do not have pre-k experience?

Finally, regarding zip code, students living in zip code 06710 appear to be at the lowest risk of performing at level one. For example, only 10% of children living in zip code 06710 performed at level one in language and literacy as compared to 19% among children in 06704. However, with some exceptions, differences between zip codes at performance level three were not as wide.

[12] However, comparing to White students in this case should be interpreted with some caution due to the low number of White students in some categories.

Table 5: Performance at level one among students with & without pre-k experience: Racial/ethnic and zip code comparison

	Language L1		Literacy L1		Personal L1		Numeracy L1		Physical L1		Creative L1	
	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K
Black	21%	19%	15%	22%	13%	16%	14%	20%	10%	13%	11%	13%
Latinx	17%	19%	18%	20%	15%	14%	18%	20%	10%	10%	12%	12%
White	**10%***	18%	**10%***	18%	**8%***	16%	**10%***	16%	**	14%	**	13%
06704	19%	18%	19%	20%	14%	14%	20%	20%	9%	11%	11%	12%
06705	14%	18%	15%	18%	13%	12%	15%	16%	11%	10%	12%	11%
06706	14%	14%	18%	24%	13%	13%	18%	23%	12%	14%	12%	15%
06708	17%	19%	17%	17%	16%	16%	17%	18%	12%	11%	13%	12%
06710	**10%***	18%	**10%***	20%	**12%***	12%	**10%***	17%	**	8%	**	10%

*Includes a low number of students and comparisons to this racial/ethnic subgroup or zip code should be interpreted with caution.; **The sample of students is too small (e.g., fewer than 10 students) and therefore the percentage is excluded from the table.

Table 6: Performance at level three across students with & without pre-k experience: Racial/ethnic and zip code comparison

	Language L3		Literacy L3		Personal L3		Numeracy L3		Physical L3		Creative L3	
	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K	Pre-K	No Pre-K
Black	20%	10%	16%	9%	17%	12%	14%	9%	20%	13%	19%	13%
Latinx	19%	9%	16%	8%	20%	11%	15%	8%	22%	13%	21%	12%
White	17%	13%	14%	11%	19%	16%	13%	10%	18%	18%	18%	16%
06704	16%	12%	16%	10%	19%	14%	17%	11%	23%	17%	22%	17%
06705	22%	8%	17%	6%	23%	11%	16%	7%	22%	12%	22%	12%
06706	14%	14%	13%	10%	13%	13%	12%	10%	13%	12%	14%	12%
06708	17%	8%	17%	17%	16%	16%	13%	6%	19%	11%	17%	7%
06710	22%	10%	17%	11%	12%	12%	17%	10%	24%	15%	23%	13%

Appendix

This appendix provides a brief overview of the methodology involved in producing this report. While we provide a general overview in this section, some methodological decisions were more specific and are described within the previous sections of this report.

KEI inventory

The KEI inventory is administered to kindergarten students across Connecticut during the fall. This inventory assesses students across six indicators: literacy, language, numeracy, physical, creative, and personal. Each indicator is scored according to three levels. Level one, the lowest performance level, identifies students that need extra support. Level two identifies students that are in need of some extra support. Finally, level three, the highest performance level, identifies students that need minimal support. Scores across the six indicators are then summed and divided by the total number of times within each domain to produce an average score.

Data

Aggregate data were provided to the Bridge to Success by the Waterbury Public Schools. The data were then released to the research team. The data contained KEI inventory scores of kindergarten students who were assessed across Waterbury Schools during the fall of the 2018-19 school year.

Analysis

All data were initially analyzed by WPS, which consisted of a series of cross-tabulations. The research team only received aggregate KEI scores across a range of socio-demographic factors (e.g., scores by pre-k experience, school readiness site). The research team did not have access to the student-level data, and therefore, only reviewed summary data.

Methodological Limitations

Several limitations to this study should be noted. First, while the KEI inventory is utilized state-wide, it is intended to only provide a snapshot of school readiness. Other screening tools exist that have been more thoroughly vetted and include standardized protocols for assessment. Second, the research team was limited to the review of aggregated data, and

student-level data would have allowed for a more nuanced and rigorous review. For example, we were unable to determine if differences between groups of students (e.g., students with and without pre-k experience) are statistically significant. Therefore, such differences are not fully conclusive and should be interpreted as general trends.