



# ImpactTulsa Early Learning Data Link Proof of Concept

**Findings and Learnings**

August 19, 2016

## Executive Summary



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Tulsa, Oklahoma, like many metropolitan regions across the United States, works to serve a dense population of underprivileged students. Many students in Tulsa and Union Public Schools, two of the larger school districts in the region, enter the districts as kindergartners already at an academic disadvantage compared to their more well-off peers. In an effort to address this achievement gap, the state of Oklahoma offers universal Pre-Kindergarten education to all of its four-year-olds, and private/non-profit providers have provided many even younger students with early childhood education.

Given this current state, many providers within the Tulsa community are asking the following questions:

1. What are the characteristics of families who do and do not enroll their children in identified partner early childhood education and/or other partner youth programs in Union and Tulsa School districts?
2. What is the relationship between involvement in early childhood education programming provided by project partners and attendance and formal assessment results in grades K-3?

ImpactTulsa has organized a group of Pre-K<sup>1</sup>, K-12 and other service providers to develop an integrated data system that would answer these questions and more. This report represents the results of the proof of concept project for that system, in which the data of six community service and education providers was linked to conduct analyses that would answer the two above questions.

The project followed the steps below, intended to mirror the development of an integrated data system:

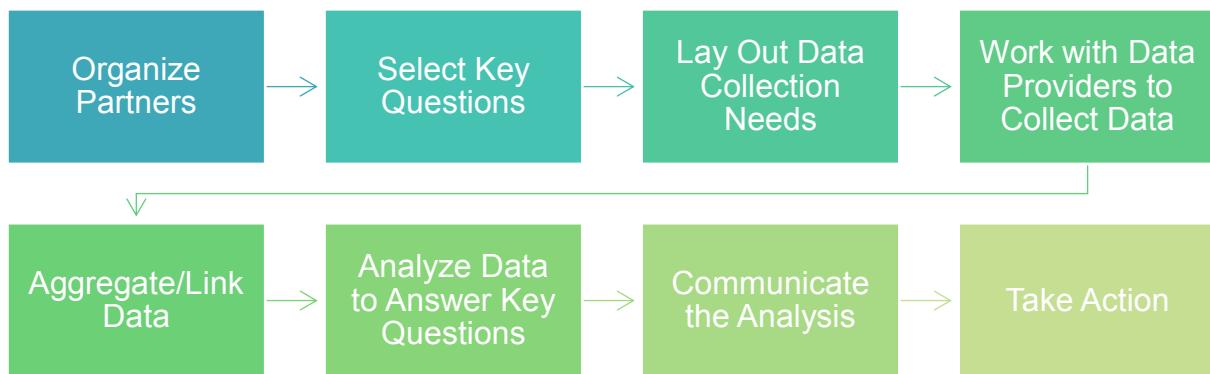


FIGURE 1: PILOT PROJECT STEPS

<sup>1</sup> While we know that we recognize that many providers only use the term "Pre-K" for a student's age 4 year, we have attempted to simplify the language throughout this report by classifying all classroom-based student programming prior to kindergarten as "Pre-K".



## Data Collection

In order to answer these questions, we collected student demographic, program and school enrollment, program and school attendance, and student outcome data over the past ten school years from six partners. The Figure 2 is a glance at the scope of this project by the numbers:

Number of Data-Providing Partners	6
Number of School Years' Worth of Student Data	10
Number of Students in Dataset	48,468
Number of Kindergartners from 2012-2013 to 2014-2015	15,417
% of those Kindergartners who we were able to link to Pre-K records	73%

FIGURE 2: THE DATA LINK PROJECT BY THE NUMBERS

Our partners were Tulsa and Union Public School Districts, CAP and Educare (early childhood programs focused on serving at-risk students), Reading Partners (a reading intervention program for low-performing students) and the Tulsa Health Department.

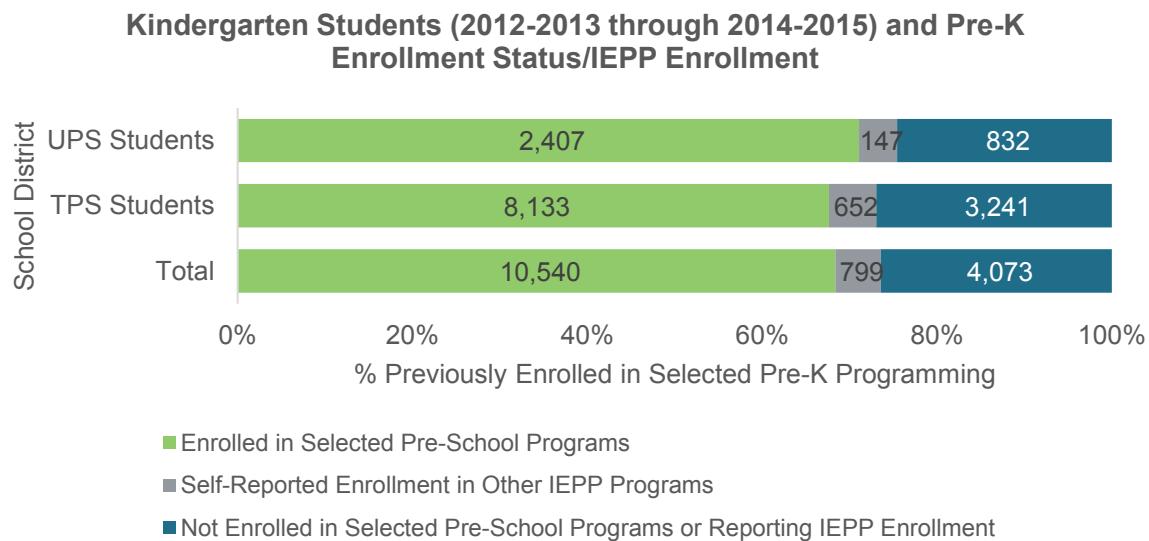


FIGURE 3: PRE-K ENROLLMENT STATUS/IEPP ENROLLMENT FOR KINDERGARTEN STUDENTS (SY12-13 THROUGH SY14-15)<sup>2</sup>

<sup>2</sup> IEPP stands for Initial Enrollment in Prior Programming. It is a data field collected by the districts in which, upon enrolling their children in the school district, parents report as to whether or not the student was enrolled in prior early childhood programming.

We linked this data between programs using probabilistic matching and produced a file of the demographic, geographic, Pre-K programming, and school district data for 15,412 kindergartners in the two school districts from 2012-2013 through 2014-2015. 70% of these kindergarteners were linked to some type of Pre-K programming (from one of four service providers: TPS, UPS, CAP, or Educare). This linkage is important, as it proves that an integrated data system is a feasible option, even without common identifiers in data sets.

## Results: What Families Do and Do Not Enroll Their Children in Pre-K Programming?<sup>3</sup>

Finding 1: Students were enrolled in selected Pre-K programs at higher rates in the north and east of Tulsa than they were in the southwest area.

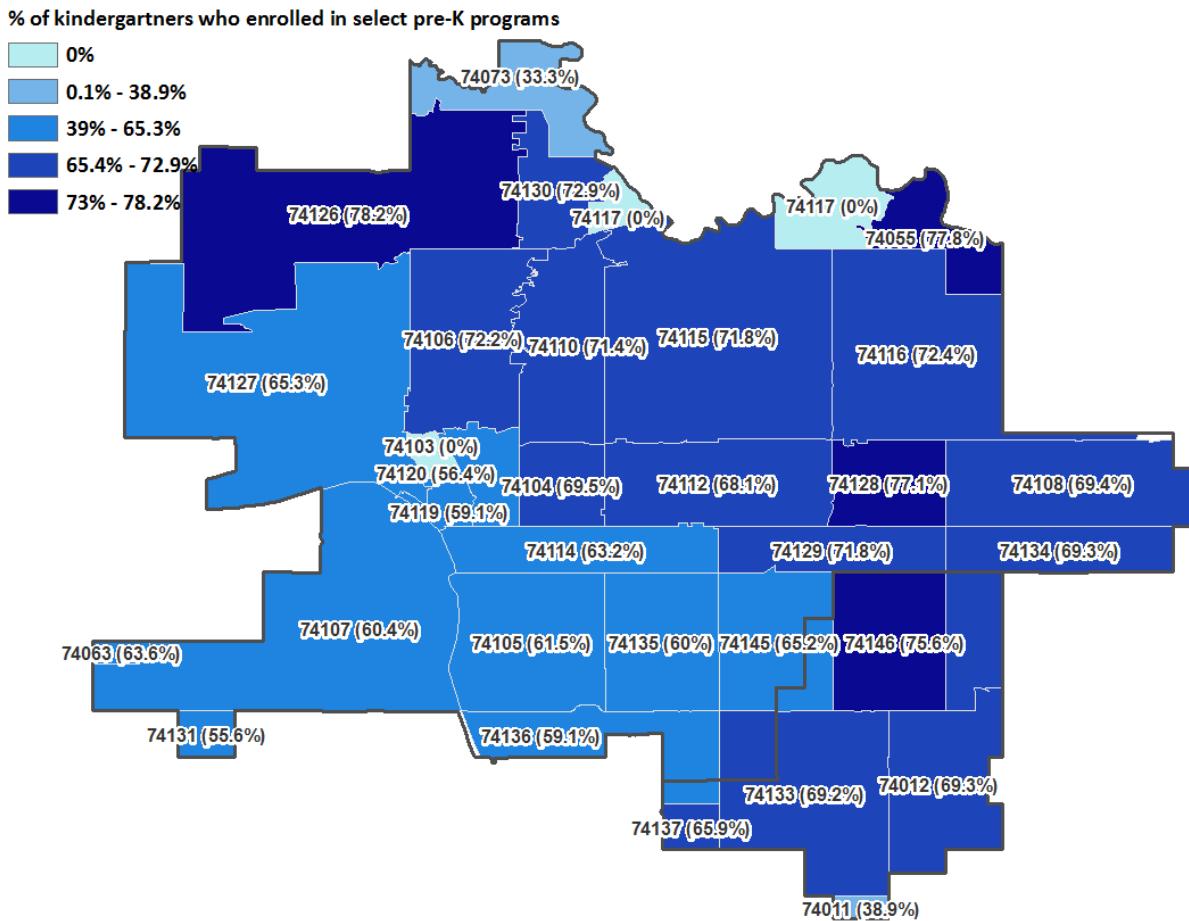


FIGURE 4: PERCENT OF KINDERGARTNERS WHO ENROLLED IN SELECT PRE-K PROGRAMS

The four largest Pre-K programs (CAP, Educare, TPS and UPS) enrolled 60-65% of eligible students in the southwest, the historically more affluent area of Tulsa. In the north and east parts of the Tulsa

<sup>3</sup> Data Note: Full regression results for all regressions are available in the appendix. Unless otherwise noted, all visualizations are based on students in 2013-2014 through 2015-2016 Kindergarten cohorts only.



region (where we find more students we might consider to be at-risk), between 70% and 80% of eligible students enrolled in Pre-K.

One hypothesis for this is that CAP and Educare are means-targeted programs, and thus focus on enrolling at-risk youth. Another possibility is that the wealthier students are attending private Pre-K providers.

### Finding 2: At-risk students were enrolled in selected Pre-K programs at much higher rates than non-at-risk students.

#### Percentage of Students with Given Characteristics Ever Enrolled in One or More Selected Pre-K Programs

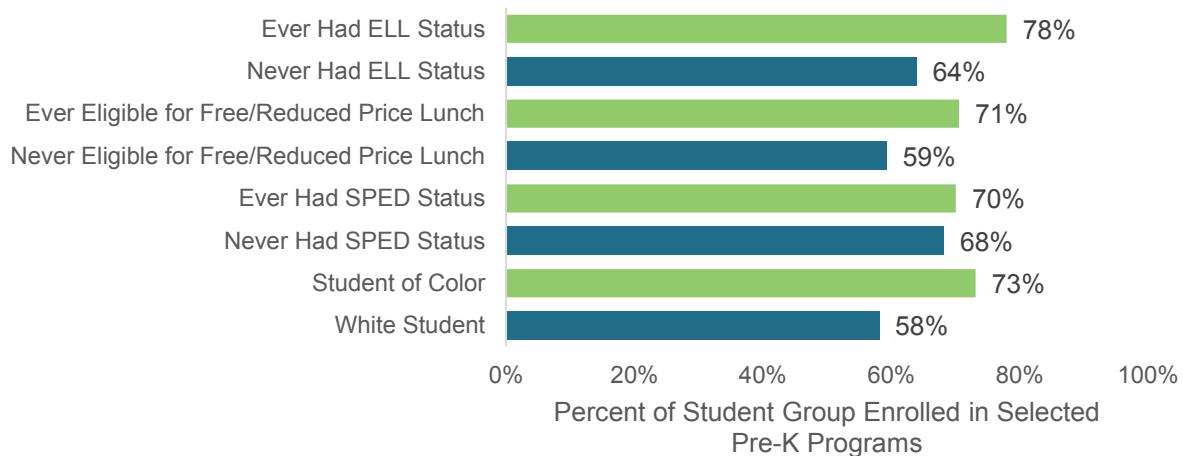


FIGURE 5: PERCENTAGE OF STUDENTS WITH GIVEN CHARACTERISTICS EVER ENROLLED IN ONE OR MORE SELECTED PRE-K PROGRAMS

We found that for each of four different student characteristics used to indicate at-risk status (English Language Learner, Ever Eligible for Free or Reduced Price Lunch, Special Ed recipient, Student of Color), students with an at-risk designation were more likely to attend selected Pre-K than those without one. This is an important finding, as it indicates that the programs have been successful in targeting Tulsa's most needy students. However, a Pre-K uptake as high as 71% for Free and Reduced Price Lunch eligible students still means that almost 30% of those students did not receive Pre-K programming. Targeting these at-risk students not receiving Pre-K must be a priority moving forward.

### Finding 3: At-Risk students in the southwest were less likely to attend Pre-K than their counterparts in the north and east.

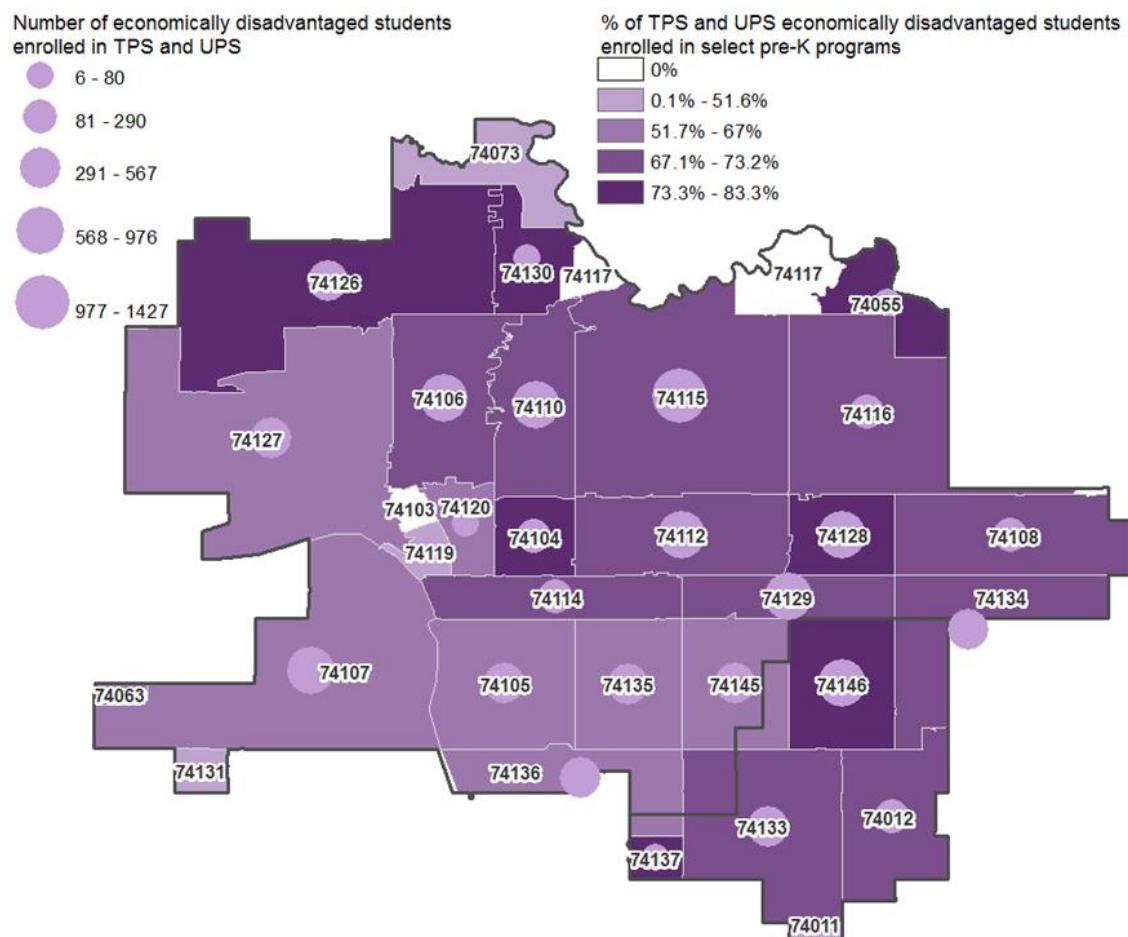


FIGURE 6: PERCENT AND NUMBER OF ECONOMICALLY DISADVANTAGED STUDENTS ENROLLED IN SELECT PRE-K PROGRAMS

This is true for ELL students, Free and Reduced Lunch students, and students of color. There were fewer at-risk students in the southwest. One hypothesis from partners is that at-risk students living in more affluent neighborhoods do not have a strong community of peers who are also attending these selected Pre-K programs. Without access to community information pipelines and word of mouth, students in these neighborhoods are less informed about their Pre-K options. This would indicate the need for stronger and more surgical Pre-K targeting of at-risk students in these southwest Tulsa neighborhoods.

Finding 4: However, the majority of at-risk students missing Pre-K still came from the north and the east.

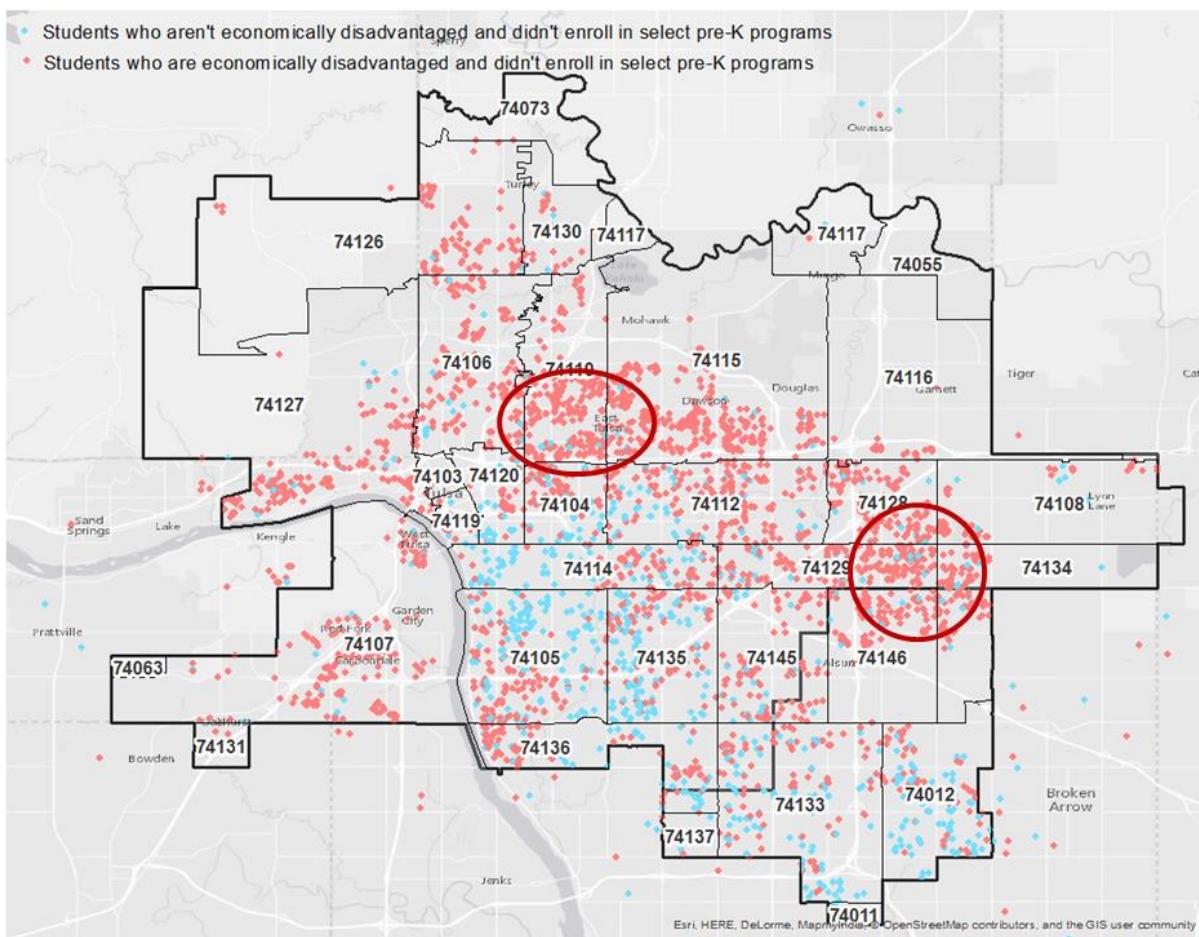


FIGURE 7: STUDENTS NOT ENROLLED IN PRE-K BY ECONOMIC STATUS

Even though these crowded neighborhoods have high levels of access to Pre-K, nearly one in four students in these areas did not enroll. This means large absolute numbers of students were missing out on Pre-K. One hypothesis from partners is that this represents the capacity constraints that many Pre-K programs face in their most at-risk neighborhoods.

Finding 5: At a zip code level, high levels of public transportation commuting were significantly related to lower levels of Pre-K enrollment.

A possible hypothesis for this occurrence is that children of parents who take public transit are less likely to have a way of traveling to Pre-K. A similar finding is that students in zip codes with higher levels of illegal drug abuse tended to enroll in Pre-K at significantly lower rates than in other areas. Further investigation into both of these issues is needed, but if either is the case at the individual level, they both are actionable/addressable blockers to students not enrolling in Pre-K at higher levels.



## Results: Does Pre-K Enrollment Have a Positive Relationship with K-3 Outcomes?<sup>4</sup>

Finding 1: Select Pre-K programming and early elementary attendance were positively related.

### Relationship Between Student Characteristics, Program Enrollment and Kindergarten Attendance Rate (via Multivariate Regression)

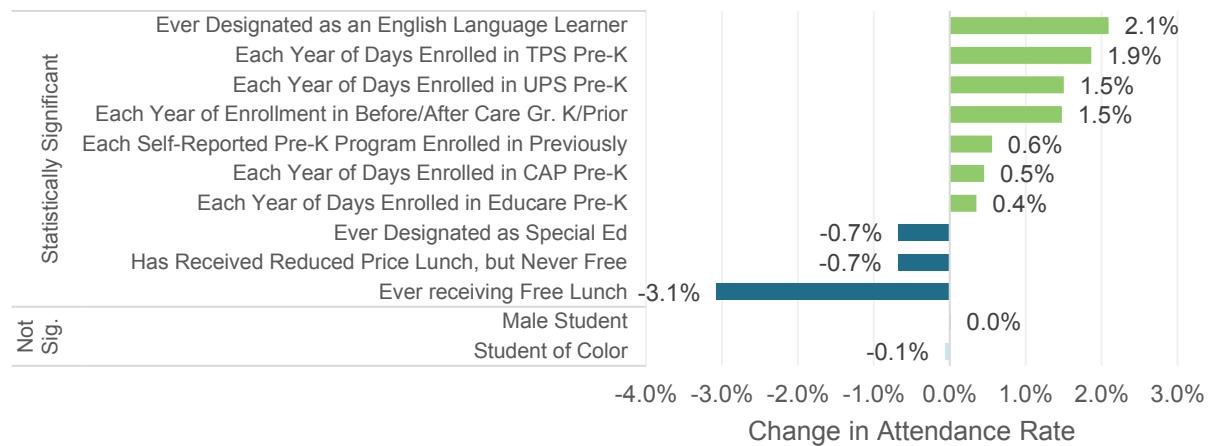


FIGURE 8: RELATIONSHIP BETWEEN STUDENT CHARACTERISTICS, PROGRAM ENROLLMENT AND KINDERGARTEN ATTENDANCE RATE

Having ever been enrolled in any of the four select Pre-K programs had a positive relationship with a student's kindergarten *and* second grade attendance rates, although the magnitude was slightly smaller in second grade. This is an important finding as it demonstrates the likely benefit received by those in these Pre-K programs, even compared to non-enrolled students who may have taken part in private Pre-K programming.

Also note that the risk factors identified in the first question are not all related to attendance in the same way, with ELL students attending at higher rates, while Special Education students and Free and Reduced Price lunch recipient students attended at lower rates.

<sup>4</sup> Data Note: Full regression results for all regressions are available in the appendix. All visualizations based on students in 2013-2014 through 2015-2016 Kindergarten cohorts only.



## Finding 2: Longer Pre-K enrollments are related to better attendance.

### Relationship Between Kindergarten Attendance Rate and a Year of Pre-K Enrollment (Measured Two Ways)

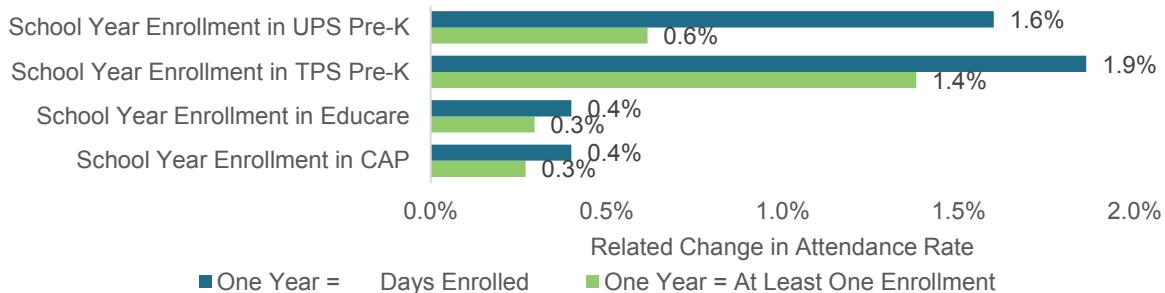


FIGURE 9: RELATIONSHIP BETWEEN KINDERGARTEN ATTENDANCE RATE AND A YEAR OF PRE-K

A year's worth of days enrolled in each program is more positively related to kindergarten attendance than is just being enrolled at least once during a year.

## Finding 3: Select Pre-K enrollment was related to higher Kindergarten reading and math levels.

While each of the risk factors identified in the first question was related to lower performance on the kindergarten NWEA, it is important to note that enrollment in Pre-K programming canceled out much of the negative relationship between those risk factors and student achievement.

### Relationship Between Student Characteristics Program Enrollment and Kindergarten NWEA Fall Reading RIT Score (via Multivariate Regression)

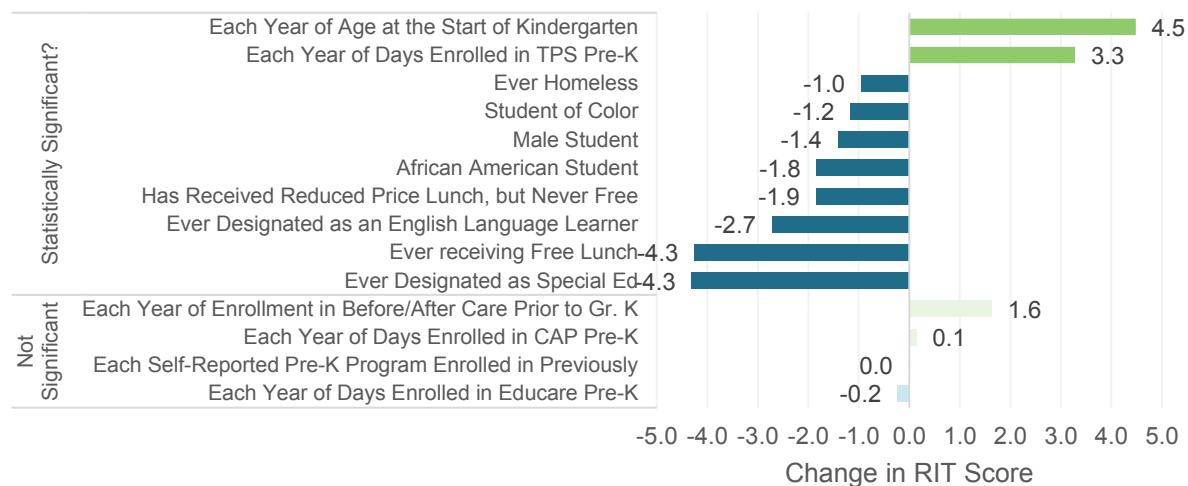


FIGURE 10: RELATIONSHIP BETWEEN STUDENT CHARACTERISTICS PROGRAM ENROLLMENT AND KINDERGARTEN NWEA FALL READING RIT SCORE

<sup>5</sup> The legend states that the blue series is "One Year = \_\_\_ Days Enrollment". The blank space has been left because the number of days enrolled that equates to a year varies by program.



## Finding 4: There was not a significant relationship between select Pre-K enrollment and 3rd grade reading and math performance.

This is consistent with what other partners have found in their own impact studies. However, attendance rates were positively related to 3rd grade performance. As Pre-K enrollment was positively related to student attendance, this may be an avenue for further investigation.

## Moving Forward

### Next Steps from the Analysis

Several of the findings of this analysis suggest possible actions that could be taken by the partner group. They include:

1. Conduct targeted outreach in areas where fewer students attend selected Pre-K
2. Expand capacity in areas with higher levels of at-risk students
3. Further investigate why some students did not attend selected Pre-K, including the possibility that transportation was a factor
4. Work to keep kids in Pre-K programs once they are enrolled
5. Utilize this research to communicate urgency to potential partners and partners throughout the region

Project partners have also offered creative ideas about other possible uses for, or investigations of, this aggregated data set. As such, ImpactTulsa should work out processes for sharing of data, as well as of analysis results.

### Next Steps Towards an Integrated Data System (IDS)

Ideally in the long run, an integrated data system would enable Tulsa area providers to address issues of student enrollment, retention, attendance and performance in real time. This project was the first step in that journey.

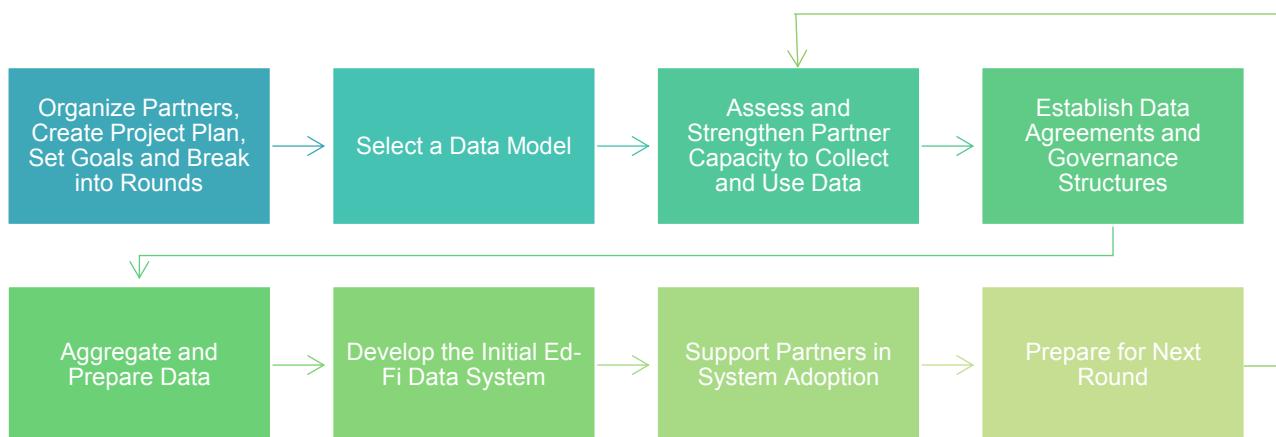


FIGURE 11: STEPS TOWARD BUILDING AN INTEGRATED DATA SYSTEM (IDS)



As the next steps of building an IDS are similar to the steps completed within this project, partners have the opportunity to use this project as a springboard towards IDS development. Next steps can be found in the figure above. More detail on each of these steps can be found in the body of this report. We recommend that ImpactTulsa starts with a limited number of goals or questions and a few partners. Using these goals, and the fact that almost all of the currently collected data aligns with Ed-Fi data standards, ImpactTulsa can build a relatively narrowly focused data system that can grow over time as more questions are asked and more partners are added.

## Conclusions

This project has proven that an integrated system for Tulsa early childhood data is feasible and necessary. ImpactTulsa and its partners have the opportunity to use the results of the analysis herein to directly improve the lives of the children of UPS and TPS. Furthermore, having built momentum through this project, they have the opportunity to take the next steps towards an integrated data system that can be used to serve students across the region.