Baltimore Education Research Consortium

Born in Baltimore

Faith Connolly
Jeffrey Grigg
Curt Cronister
Stephanie D’Souza

Baltimore Education Research Consortium

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Jonathon Rondeau, President & CEO, Family League of Baltimore City
Dr. Gregory Thornton, Ed.D., Chief Executive Officer, Baltimore City Public Schools

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Table of Contents

Executive Summary ........................................................................................................... v
Background ...................................................................................................................... 1
Methodology .................................................................................................................. 3
Findings ............................................................................................................................ 5
  Born in Baltimore City .................................................................................................... 5
  Service Use .................................................................................................................. 7
  Not Using Services ..................................................................................................... 9
Eligible and Not Using Services .................................................................................... 10
Neighborhoods of Eligible Not Using .......................................................................... 11
Anticipated Supply and Demand .................................................................................... 13
Discussion ....................................................................................................................... 18

Appendix A: Match Rates
Appendix B: Pathways
Appendix C: Infographics of Mothers and Infants
List of Tables

Table 1  Descriptive Statistics of Children and Mothers Living in Baltimore City Born Between September 2, 2007 Through September 1, 2008 Who Participated in Early Education Services ................................................................. 5

Table 2  Retrospective and Forecast Kindergarten Enrollments Based on Baltimore City Birth Cohort Size .................................................................................................................. 16
List of Figures

Figure 1  Births from September 2, 2007 Through September 1, 2008 by neighborhood...6
Figure 2  Service use rates for the cohort of children born September 2, 2007 through September 1, 2008 with records in other programs .................................................7
Figure 3  Program stops for children born September 2, 2007 through September 1, 2008 with records in other programs by most used pathway to least used .......................8
Figure 4  Pathway of children born September 2, 2007 through September 1, 2008 with counts ..............................................................................................................9
Figure 5  Mother and infant characteristics at time of birth for children born September 2, 2007 through September 1, 2008 for participants using other services and those who did not. (Information about fathers unavailable.) ..............................................10
Figure 6  Mother and infant characteristics at birth for children born September 2, 2007 through September 1, 2008 who were eligible for priority Pre-K seats but were not enrolled in Pre-K or Head Start. (Information about fathers unavailable.) .11
Figure 7  Neighborhoods of Mothers at time of birth for children born September 2, 2007 through September 1, 2008 who were eligible for priority Pre-K seats but were not enrolled in Pre-K or Head Start ..................................................................................12
Figure 8  Number of children enrolling in City School kindergarten (2001-02 through 2014-15) and birth rates six years prior (1995 through 2014) ........................................13
Figure 9  Different methods of estimating potential kindergarten enrollment, a percent of total births or a two-step method using a percent of birth plus a percent of new entrants ..................................................................................................................15
Figure 10  Baltimore neighborhoods of eligible children who enrolled in K fall 2013 and fall 2014 but not Pre-K or Head Start as a 4-year old .......................................................17
Two children sit next to each other on the first day of kindergarten at Gwynns Falls Elementary School in the Gwynns Falls community. The Greater Mondawmin area of West Baltimore in which Gwynns Falls is located is a predominantly working class African American community in which 15% of the population aged 25 and over has attended at least some college, 37% of the population aged 16-64 are not in the labor force, the median household income is approximately $38,000, and 36% of children live below the poverty line (BNIA, 2015).

The first child is embarking on her third year of formal education and her second year at Gwynns Falls. As a three-year-old she attended an Emily Price Jones Head Start program at St. Cecilia’s Catholic Church for a year before she “graduated” to the four-year-old Pre-Kindergarten program at Gwynns Falls. Now that she is five, not only has she already been introduced to foundational knowledge in literacy and mathematics, she is emerging as an expert at navigating school culture: She knows the rhythm of a school day, and the norms of interacting with peers and adults in school settings.

The other child has been cared for by an informal network of family members and acquaintances; she has had less exposure to the building blocks of formal schooling and lacks familiarity with the norms and rhythms of a typical, structured school day.

This scenario describes the challenges service providers, especially Baltimore City Schools (City Schools), experience. These different pathways from birth to kindergarten reflect varying levels of kindergarten readiness seen in children when they enter school at age five. To help understand these pathways, several service providers in Baltimore joined together to form the Early Education Data Collaborative (EEDC). Participating agencies include: Baltimore City Health Department, Baltimore City Public Schools (City Schools), The Ark, Baltimore City Head Start, Family League, and Maryland Family Network.

This report shares descriptive findings from the collaborative to date. A sampling of the findings:

- Just under two-thirds of children born to mothers who resided in Baltimore at the time of their birth were found to participate in some form of publicly-provided early education program in the City, and over half of the children born in Baltimore subsequently enrolled in Baltimore City Schools for kindergarten.

- Approximately three-quarters of children enrolled in City Schools Pre-K and kindergarten were born to mothers who resided in Baltimore at the time of their birth.

- The most common pathway was not enrolling in another program. The second most common pathway was to enroll in City Schools Pre-K, kindergarten and then first grade. Over 1,000 kindergartens born in Baltimore, however, enrolled without prior experience in Pre-K or Head Start.
• Substantial numbers of kindergarteners qualified for priority seating in Pre-K but did not enroll. The mothers of these children were more likely to be young (24.0 compared to 25.9 for all mothers in the cohort), African American (83% compared to 68%), receive Medicaid/MCHP (84% compared to 67%), and not hold a high school diploma at the time of their child’s birth (43% compared to 27% overall). These mothers were also likely to live in certain areas of the city.

This report provides a first look into the EEDC partnership, a descriptive analysis of mothers and children as well as service usage. We are limited by what we do not know, specifically, other programs serving these children and any information on fathers, because nationally, birth data is linked to the mother and not the father of the child. We hope that over time we will have more information to shed light on those two areas.
Born in Baltimore

Background

Knowing investments in early education should have lasting impacts on low-income children, the Baltimore Education Research Consortium (BERC) created an Early Education Data Collaborative (EEDC) in Baltimore. Participating agencies include: Baltimore City Health Department, Baltimore City Public Schools, The Ark, Baltimore City Head Start, Family League, and Maryland Family Network.

Nationally, the math and literacy skills of low-income children are a full year behind those of high-income children at the time of kindergarten entry, and these gaps do not diminish by eighth grade (Duncan & Murnane, 2014). A substantial literature documents the benefits of early childhood education and formal preschool experiences on children’s school readiness, with low-income and otherwise disadvantaged children benefitting the most from these programs (Barnett, 2011; Camilli, Vargas, Ryan, & Barnett, 2010; Duncan & Magnuson, 2013; Reynolds, Temple, & Ou, 2010).

Though early childhood education rose to the top of the policy agenda, several problems pervade the early learning system and the research supporting it. Over time, policy expansions occurred in a piecemeal fashion, with disparate programs targeting disadvantaged children funded by federal, state, and local sources (Jenkins, 2014; Meyers, Gornick, & Peck, 2001). In fact, most of the top scholars in the field refer to the U.S.’s early learning system as “fragmented” (Clifford & Crawford, 2009; Gallagher, Clifford, & Maxwell, 2004; Halpern, 2000; Kamerman & Kahn, 2001; Lombardi, 2003; Meyers, 1993; Pianta, Barnett, Burchinal, & Thornburg, 2009; Stoney, Mitchell, & Warner, 2006).

A consequence of this uncoordinated system is that preschool-aged, low-income children may participate in incongruent public programs over the course of multiple years. Families can struggle to navigate the complex early learning system and some children do not experience early care until kindergarten entry (Adams, Snyder, & Sandfort, 2002).

These navigation challenges are present in Baltimore just as in the nation. Beginning in 2010, several Baltimore City organizations serving families with young children began to work together to expand their view of the role each plays in Baltimore, which led to the creation of the Early Education Data Collaborative (EEDC). Significant programmatic changes have occurred among EEDC partner agencies, including a change in service provision for 3- and 4-year olds as of fall 2014. Head Start focused on serving 3-year olds allowing City Schools to focus on 4-year olds. These changes were made to increase efficiencies, serve more children, and align services and connect children and families from one program to the next.

A primary goal of the EEDC is to gain a better understanding of early childhood pathways for Baltimore City children. Data shared by EEDC partner agencies provides information on participation in early childhood programs from birth through age 5. While most programs collect data on the children and families served, these data vary by
program. For example, one program captures the details of services provided and length of service, while another simply indicates a yes or no to program receipt. This variance depends on the organization and why data are collected—whether for billing requirements, their own use, or accountability purposes.

These data cover domains like prenatal healthcare, birth outcomes, home visiting programs, attendance in specific child care programs, as well as enrollment and attendance in Head Start and Baltimore City Schools. Unfortunately, the data collected by these organizations, though rich and potentially beneficial, remain in silos with each organization deciding what to collect, what is retained, how often to collect it, and how to use it according to its own organizational needs, when in reality the services such organizations provide are often tightly linked to outcomes being sought by other agencies with which the same families interact.

Through the EEDC, partner agencies meet several times during the year to review findings from the collected data and pose questions of interest for their programs and for Baltimore City’s vision of support for young families. We hope that discoveries made through this partnership will lead to other innovations for young families.

This report provides a first look into the EEDC partnership, a descriptive analysis of mothers and children as well as service usage. We are limited by what we do not know, specifically, other programs serving these children and any information on fathers. We hope that over time we will have more information to shed light on those two areas.
Methodology

In this report, we will address the following research questions.

1) Who are the children born in Baltimore City?

2) What programs do families and children access?

3) Who uses services and who does not?

4) Are there families and children who are eligible for but do not enroll in City services?

5) In what neighborhoods do those who are eligible for services, but do not use them, live?

6) Looking forward, is there any reason to expect an increase or decrease in service use, a change in either supply or demand?

Data. In December 2013, BERC invited Baltimore City agencies serving children and their families to form the Early Education Data Collaborative. The original intention was to follow early childhood trajectories of children born to Baltimore City residents. Participating agencies include: Baltimore City Health Department, Baltimore City Public Schools, The Ark, Baltimore City Head Start, Family League, and Maryland Family Network.

Records were linked using child’s first and last name and birth date, first, using exact matching methods, and second, using a probabilistic (or “fuzzy”) matching method (Christen, 2012; Wasi & Flaaen, 2015). Data were cleaned in preparation for the matching to ensure that the matching variables (child’s first name, last name and date of birth) were formatted consistently across the constituent datasets. Second, child’s first name, last name, gender, and date of birth were linked. Although participating agencies generally use the official first and last names from the child’s birth certificate, typos and data entry discrepancies prevented some records from being matched. Next, probabilistic linking techniques were used to link unmatched records, in which an algorithm assigned each additional match a score ranging from 0 to 1 rating the probability of the match with 1 indicating an exact match.

Match Rates. All matches with a score above 0.6 were reviewed manually for accuracy of the match. As a general rule, matches with a probability score of 0.67 and above were identified as matches during clerical review. Matches that fell below this threshold score were nearly always discarded. The following rules were applied during manual inspection of fuzzy matches: first and last names were compared in order to determine if a match was reasonable. In most cases, minor discrepancies in first and last names prevented records from being matched in the exact merge procedure. These discrepancies included differences in hyphenation, apostrophes, suffixes, and minor contradictions in spelling.
Matching Results. Substantial numbers of students were matched through program providers. 64% of children born in Baltimore in the 2007-2008 cohort were identified in at least one other agency’s file, and birth records were matched to 76% of the kindergarten students, 77% pre-kindergarten students, and 77% of children who attended Head Start. The other combinations of programs were comprised of very small numbers of children.

For the purposes of this report, we will provide information about the cohort of children born September 2, 2007 through September 1, 2008. Analysis of the second cohort resulted in comparable match rates, and descriptive findings.

Maps. Geographic analyses were used to show where mothers whose children did or did not later enroll in City services resided at the time of their child’s birth. We aggregate the 200+ census tracts to 55 Community Statistical Areas (CSAs). These clusters of census tracts have the advantage of being more interpretable than individual census tracts and may also smooth out year-to-year variations and identify clearer trends. One disadvantage of using CSAs is that two of them—Canton and Downtown/Seton Hill—are served by elementary schools just outside their boundaries. Because CSAs average data across neighborhoods forming a CSA, another disadvantage of using CSAs is that CSAs can mask inequities across neighborhoods due to the larger levels of aggregation.

Limitations

- We are able to report only on the data from our partners. Children from organizations that did not participate are excluded and may bias any findings or determinations.

- Information on fathers is not consistently available through birth records because birth records are linked to the mother who has given birth. For that reason, there is discussion of mothers only.

- We know all home visiting participants were born to mothers living in the city, yet our match rate is not 100%. This provides an error estimate of approximately 12% for all findings in this report.
Findings

Born in Baltimore

A total of 9,694 children were born between September 2, 2007 through September 1, 2008 in Baltimore City. Overall, the majority of mothers were African American (68%), and had at least a high school diploma or GED (36% high school or GED only, 14% some college, 23% college graduate). Fewer than one in five was 19 or younger. Two-thirds of the mothers qualified for medical assistance (or were pending approval), and about one in ten had a preterm birth. See Table 1 for details.

Following birth 6,166, or 64%, of families used another early education service such as home visiting, Head Start or City Schools. While no information is available on fathers, most mothers were African American (82%), had a high school diploma or GED (42%), qualified or were pending approval for medical assistance (77%).

Table 1
Descriptive Statistics of Children Born to Mothers Living in Baltimore City Between September 2, 2007 Through September 1, 2008 And Who Participated in Early Education Services

<table>
<thead>
<tr>
<th>Birth Cohort</th>
<th>Did Not Use Services</th>
<th>Used Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=9,694</td>
<td>N=3,528</td>
<td>N=6,166</td>
</tr>
<tr>
<td>36%</td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td>Mother’s Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>68</td>
<td>%</td>
</tr>
<tr>
<td>White</td>
<td>22</td>
<td>%</td>
</tr>
<tr>
<td>Latina</td>
<td>6</td>
<td>%</td>
</tr>
<tr>
<td>Asian</td>
<td>2</td>
<td>%</td>
</tr>
<tr>
<td>Mother’s Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Than HS</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>Less Than HS &amp; Age 20 or Older</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>HS Diploma/GED</td>
<td>36</td>
<td>26</td>
</tr>
<tr>
<td>Some College</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>College Grad</td>
<td>23</td>
<td>43</td>
</tr>
<tr>
<td>Other Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Assistance (&amp; pending)</td>
<td>67</td>
<td>48</td>
</tr>
<tr>
<td>Mother 19 or Younger</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>Preterm Birth</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Low Birth Weight</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Mother Married at Birth</td>
<td>30</td>
<td>51</td>
</tr>
</tbody>
</table>
In contrast, 36% of families did not use service in the city. These mothers were African American (44%) and White (44%), more had completed college (43%), and 48% qualified or were pending approval for medical assistance.

As seen in Figure 1, births were distributed across the City with some concentration in the northeast, southeast and southern peninsula.

Figure 1. Births from September 2, 2007 Through September 1, 2008 by census tract.
Children and Family Service Use in Baltimore

As seen in Figure 2, approximately two-thirds of children and their families are found in other service providers systems. The home visiting programs provided by the Maryland Family Network and Family are available only to residents of Baltimore and should have 100% match. This speaks to the challenges of matching children and families. Almost three-quarters eventually enroll in City Schools Pre-K and kindergarten.

Figure 2. Service use rates for the cohort of children born September 2, 2007 through September 1, 2008 with records in other programs.
In addition to understanding the percent of students who used services, we mapped out the services used in two different ways. Figure 3 describes program stops, or a *metro map* describing the program pathways followed by at least 10 children. The most common pathway is children born and never seen again in any program. The second is from birth to Pre-K to kindergarten, and then first grade. The third most common pathway is from birth directly to kindergarten and first grade. One of the more intriguing pathways shows 140 children who were first seen in first grade.

Figure 3. Program stops for children born September 2, 2007 through September 1, 2008 with records in other programs by most used pathway to least used.
Figure 4 includes the pathways for all children born September 2, 2007 through September 1, 2008 to mothers who lived in the City and their interaction with programs through age 5. Another way we visualized the pathways was to concentrate on a single program and identify the pathways children took from there. See Appendix B for detail on all programs.

Figure 4. Pathway of children born September 2, 2007 through September 1, 2008 with counts for all children found in other programs.

See Appendix B for pathway charts for other programs.

Families and Children Who Use or Do Not Use Services

As seen in Table 1, and in the pathway visualizations, many families and children use publicly available services. With only information about mothers and their newborn children we can describe a little about who they are. For example, compared to the 3,390 mothers who we could not match to the data provided by service providers, the 6,166 mothers who used public services were younger (24.7 compared to 27.9), fewer were
married (18% compared to 51%), a greater proportion were African America (82% compared to 44%), and had approximately the same amount of preterm births, less than 37 weeks (14% compared to 11%).

Figure 5. Mother and infant characteristics at time of birth for children born September 2, 2007 through September 1, 2008 for participants using other services and those who did not. (Information about fathers is unavailable.)

<table>
<thead>
<tr>
<th>Used Baltimore Services</th>
<th>Did Not Use Baltimore Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Average age was 24.7 years, with 23% under 20</td>
<td>• Average age was 27.9 years, with 9% under 20</td>
</tr>
<tr>
<td>• 18% were married</td>
<td>• 51% were married</td>
</tr>
<tr>
<td>• 82% were African American, 10% were White, and 6% were Latina</td>
<td>• 44% were African American, 44% were White, and 7% were Latina</td>
</tr>
<tr>
<td>• 33% had not completed high school, and 11% held college degrees</td>
<td>• 16% had not completed high school, and 43% held college degrees</td>
</tr>
<tr>
<td>• Of high school non-completers, 61% were age 20 or older</td>
<td>• Of high school non-completers, 69% were age 20 or older</td>
</tr>
<tr>
<td>• 11% reported smoking while pregnant</td>
<td>• 9% reported smoking while pregnant</td>
</tr>
<tr>
<td>• 77% received Medicaid/MCHP</td>
<td>• 48% received Medicaid/MCHP</td>
</tr>
</tbody>
</table>

Received Services

• Average birth weight was 6.8 lbs. with 13% less than 5.5 lbs.
• Average estimated gestation was 38.2 weeks with 14% less than 37 weeks

Did Not Receive Services

• Average birth weight was 7.1 lbs. with 10% less than 5.5 lbs.
• Average estimated gestation was 38.5 weeks with 11% less than 37 weeks


Families Who Are Eligible but Do Not Use Services

Through the data collaborative, we have a unique opportunity to be able to identify who is not using services, even when eligible. For many programs we do not have the data to determine eligibility, but we do for four year olds in our cohorts. Children who enroll in
kindergarten and qualify for free or reduced price meals also qualified for priority seats in City Schools Pre-K program and/or Head Start. While the seats for both programs are limited, every year non-priority children enroll in available seats in Pre-K.

Figure 6. Mother and infant characteristics at birth for children born September 2, 2007 through September 1, 2008 who were eligible for priority Pre-K seats but were not enrolled in Pre-K or Head Start. (Information about fathers is unavailable.)

Mom
- Average age was 24.0 years, with 29% under 20
- 12% were married
- 83% were African American, 10% were White, and 5% were Latina
- 43% had not completed high school, and 5% held college degrees
- Of high school non-completers, 56% were age 20 or older
- 15% reported smoking while pregnant
- 84% received Medicaid/MCHP

Baby
- Average birth weight was 6.8 lbs. with 14% less than 5.5 lbs.
- Average estimated gestation was 38.3 weeks with 13% less than 37 weeks

Earlier BERC research found that children who were not enrolled in Pre-K as a 4-year old struggled in kindergarten and through third grade (Connolly & Olson, 2012). Their attendance was lower than their peers, they arrived less well prepared, and they never caught up to their peers through grade 3 as measured by state reading and math assessments. This leads to a next question of, are there neighborhoods or parts of the City where this is more common?
Families Eligible for but Not Using Services by Neighborhood

Continuing to use our special case of children who were eligible for Pre-K and/or Head Start yet did not enroll, Figure 7 identifies those neighborhoods including Park Heights, Midtown-Edmonson, Frankford, and Highlandtown.

Figure 7. Census tracts of mothers at time of birth for children born September 2, 2007 through September 1, 2008 who were eligible for priority Pre-K seats but were not enrolled in Pre-K or Head Start the year before.
It is not possible at this time to determine if children are not enrolled due to school space limitations or disinterest on the part of families or because families do not know that they can enroll their child. It is likely to be impacted by all three causes and a complex situation.

Anticipating Supply and Demand

One common policy for increasing access to early education systems is the offering of full day Pre-K. Currently, City Schools offers Pre-K but not in all schools or for all children. As a thought experiment, we attempt to predict the number of Pre-K seats that would be needed to provide Pre-K services to all four-year olds in the City. We do this in two different ways. First, we examine the number of kindergarten seats currently provided and, second, we examine Baltimore birth rates and predict what proportion of children might enroll four years later. To do this we looked at several sets of cohorts to help determine trends in both birth rates and enrollment in City Schools.

Figure 8. Number of children enrolling in City School kindergarten (2001-02 through 2014-15) and birth rates six years prior (1995 through 2014).

Source: Publicly reported data from Maryland State Department of Education (mdreportcard.org) and Maryland Department of Health and Mental Hygiene (Vital Statistics).

Note: Birth cohort data offset to align with expected kindergarten cohort.

The 2014-15 kindergarten cohort corresponds to a peak birth cohort five years earlier, after which the number of births in the city declined, as did the economy (Cherlin, Cumberworth, Morgan, & Wimer, 2013).
**Predicting Pre-K Enrollment from Recent K Enrollment.** We first examined changes in enrollment between Pre-K and kindergarten in each elementary school among children who were at the appropriate age for the grade (four years old on September 1 for Pre-K, five years old on September 1 for kindergarten). We found among the 7,304 age-for-grade children who enrolled in kindergarten in fall 2014, 4,577 were observed in City Schools Pre-K the prior year. This represents an increase of 2,727 children from one year to the next. In the previous year, of the 7,216 children who were between the age of 5 and 6 years old on September 1, 2013, 4,168 attended City Schools Pre-K in the prior year, for a net increase in enrollment of 3,048 children.

Not all of these schools and enrollment slots are under the direct purview of City Schools. In 2014-15, eleven charter schools enrolled 531 kindergarten students, only one of which offers Pre-K. These schools enroll students via citywide lottery rather than by geographic zone. Omitting these schools and students from the calculation yields a city-wide difference in Pre-K and kindergarten enrollment of 2,196 seats.

Taken together, these data suggest that between 2,200 (omitting charter school enrollments) and 3,000 (peak demand) Pre-K slots could be occupied by children who will enroll in City Schools kindergarten in the following year.

**Forecasting Pre-K Enrollment from Births.** Using data from the EEDC, we identified 19,233 children who were born to Baltimore residents between September 2, 2007 and September 1, 2009. These students represented potential kindergarteners in the 2013-14 and 2014-15 school years. A total of 56% of these children were identified in City Schools data in those school years. Both cohorts behaved similarly, so for clarity we present data on the first cohort of children, as in Figure 8.

In the 2013-14, there were 7,216 kindergarten students who were between five and six years old on September 1, 2013. 5,495 of these students were matched to Baltimore City birth records; the remaining 1,721 students could not be matched and we assume they are new to the City and the district (32% of the Baltimore-born group). The net difference between the birth cohort (9,694) and the native-born kindergarten cohort (5,495) represents residential mobility out of the city as well as enrollment in the private and parochial sectors. In other words, over 4,000 potential kindergarteners from each cohort leave or decline City Schools, and they are replaced by approximately 1,700 students, yielding a total kindergarten cohort (those observed to be born in Baltimore plus an additional 32%) that corresponds to 74% of the birth cohort. This is shown in Figure 9.

**Non-Enrolling Compared to Enrolling Mothers.** As described in Table 2, these non-enrolling mothers were African American (44%) and White (44%), more had completed college (43%), and 48% qualified or were pending approval for medical assistance. In contrast, mothers with children enrolling in kindergarten were African American (83%), few had a college degree (4%), and 84% qualified or were pending approval for medical assistance.
As seen in Figure 1, births were distributed across the City with concentrations along the perimeter of Baltimore (south, northwest, and northeast).

These overall trends are corroborated with the publicly reported birth cohort and subsequent kindergarten enrollment data. These data are shown in Figure 9 and Table 2. Again, as a simple proportion, the number of students in the kindergarten cohort is 74% of the number of births five years previously. This was true for both years. In prior years, however, the ratio was lower, as low as 59% for the 2005-06 kindergarten cohort. Over the fourteen years observed, the average ratio of kindergarten size to birth cohort size is 67%. We can then forecast from more recent birth cohorts the future kindergarten cohorts under two assumptions: the recent ratio (74%) or the 14-year average ratio (67%).

Figure 9. Different methods of estimating potential kindergarten enrollment, a percent of total births or a two-step method using a percent of birth plus a percent of new entrants.

Some observations:

• Interestingly, the 2008 birth cohort corresponding with the 2014-15 kindergarten cohort was among the largest in the last 20 years. Looking at this one cohort in isolation would have biased any predictions.

• Both scenarios predict enrollment declines from the 2008 birth cohort over the next five years due to declining births to Baltimore residents in recent years.

• If the recent ratio holds, kindergarten enrollment will decline to approximately 6,500 students by 2020-21.

• If the ratio returns to its historic average, kindergarten enrollment will decline to approximately 5,900 by 2020-21.
- The official 2015-16 kindergarten enrollment will provide a good initial test of this prediction model (which forecasts an enrollment of 7,033 if the enrollment trend continues at its current rate).

### Table 2
Retrospective and Forecast of Kindergarten Enrollment
Based on Baltimore City Birth Cohort Size

<table>
<thead>
<tr>
<th>K Enrollment Year</th>
<th>Births</th>
<th>K Enrollment</th>
<th>% Enroll</th>
<th>Forecast 74%</th>
<th>Forecast 67%</th>
<th>Forecast 56% + 32% external</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>9,997</td>
<td>6,270</td>
<td>63%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002-03</td>
<td>9,752</td>
<td>6,185</td>
<td>63%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-04</td>
<td>9,262</td>
<td>6,192</td>
<td>67%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>9,624</td>
<td>5,956</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>9,734</td>
<td>5,729</td>
<td>59%</td>
<td></td>
<td></td>
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<tr>
<td>2006-07</td>
<td>9,641</td>
<td>5,884</td>
<td>61%</td>
<td></td>
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<tr>
<td>2007-08</td>
<td>9,100</td>
<td>5,797</td>
<td>64%</td>
<td></td>
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</tr>
<tr>
<td>2008-09</td>
<td>9,046</td>
<td>6,124</td>
<td>68%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>9,057</td>
<td>6,353</td>
<td>70%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>9,183</td>
<td>6,420</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011-12</td>
<td>9,179</td>
<td>6,722</td>
<td>73%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td>9,757</td>
<td>7,064</td>
<td>72%</td>
<td></td>
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</tr>
<tr>
<td>2013-14</td>
<td>9,875</td>
<td>7,271</td>
<td>74%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014-15</td>
<td>9,911</td>
<td>7,349</td>
<td>74%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>9,504</td>
<td>7,033</td>
<td>6368</td>
<td>7,025</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>8,945</td>
<td>6,619</td>
<td>5,993</td>
<td>6,612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017-18</td>
<td>8,878</td>
<td>6,570</td>
<td>5,948</td>
<td>6,563</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>9,108</td>
<td>6,740</td>
<td>6,102</td>
<td>6,733</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-20</td>
<td>8,812</td>
<td>6,521</td>
<td>5,904</td>
<td>6,514</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-21</td>
<td>8,863</td>
<td>6,559</td>
<td>5,938</td>
<td>6,552</td>
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</table>

Source: Publicly reported data from Maryland State Department of Education and Maryland Department of Health and Mental Hygiene.

Neighborhood Need. These maps show where and how enrollments change between Pre-K in one year and kindergarten the following year. As seen in Figure 10, fall 2013 enrollment increased from Pre-K to kindergarten by at least 100 for Cedonia/Frankford (an increase of 103 children), Loch Raven (an increase of 104 children), Midway/Coldstream (an increase of 129 children), Harford/Echodale (an increase of 129 children), Patterson Park North and East (an increase of 179 children), and Southern Park Heights (an increase of 228 children).
The following school year, the communities where enrollment increased from Pre-K to kindergarten by at least 100 children were Sandtown-Winchester/Harlem Park (an increase of 104 children), Patterson Park North and East (an increase of 150 children), Harford/Echodale (an increase of 151 children), and Southern Park Heights (an increase of 217 children). The demand appears to be greatest in Northeast Baltimore, South Baltimore, Near West and Near East Baltimore, and Park Heights.

Some of these enrollment discrepancies can be explained by the locations of charter schools, only one of which offers Pre-K. For example, there are four schools in Southern Park Heights that enroll kindergarten students: two schools operated by City Schools and two charter schools. In 2014-15, there were 217 kindergarten students who were not enrolled in Pre-K in the prior year; 211 of these students attended the two charter schools in the area. Across the city there remained an enrollment discrepancy of nearly 2,200 seats in schools operated by City Schools (or approximately 110 classrooms), but in this part of the city, the discrepancy between Pre-K and kindergarten enrollment can be almost entirely explained by the options available.

Figure 10. Baltimore neighborhoods of children who enrolled in K fall 2013 and fall 2014 but not Pre-K as a 4-year old.

To address the extent to which charter schools that enroll students via city-wide lottery serve their local neighborhood or draw from the city as a whole, we examined the census tract of birth for the kindergarten students who attend one of the largest charter schools in

Born in Baltimore
Baltimore. For the children with matched birth records, we found that 38% of the kindergarten students were born either in the CSA in which the school is located or in an adjoining one.

As seen in Figure 10, Greater Roland Park/Poplar Hill enrolls kindergarten students who were not enrolled in Pre-K in substantial numbers, but we believe this reflects a different social process. Given the large number of private options in that part of Baltimore, increasing the number of Pre-K seats in that local market may or may not lead to increased enrollments. This case highlights the importance of available alternatives to families. We believe, but cannot yet confirm, that in some areas of the city the demand for Pre-K is greater than the publicly provided supply. Identifying those regions will require an additional level of analysis such as distinguishing programs with waiting lists from those that cannot fill their available seats. With that information in hand, we can better predict where in the city an increase in Pre-K seats, hand-in-hand with increased communication with families, might yield increased enrollments.
Discussion

Knowing investments in early education should have lasting impacts on low-income children, the Baltimore Education Research Consortium (BERC) created an Early Education Data Collaborative (EEDC) in Baltimore. Participating agencies include: Baltimore City Health Department, Baltimore City Public Schools, The Ark, Baltimore City Head Start, Family League, and Maryland Family Network.

Currently, many Baltimore City early childhood programs collect data on children and families who interact with them and receive services. Some of these data are extremely descriptive, providing details of the services provided and length of service, in comparison to some program data that simply indicate a yes or no to program receipt. The data vary depending on the organization that collects them and how and why the program began to collect the data, i.e., billing requirements versus accountability.

These data cover domains like prenatal healthcare, birth outcomes, home visiting programs, library visits and book loans, attendance in specific day care programs, as well as enrollment and attendance in Head Start and Baltimore City Schools. Unfortunately, the data collected by these organizations, though rich and potentially beneficial, remain in silos, with each organization deciding what to collect, what is retained, how often to collect it, and how to use it according to their own organizational needs, when in reality the services such organizations provide are often tightly linked to outcomes being sought by other agencies with which the same families interact.

Data shared by EEDC partners have been extremely informative of Baltimore and service usage, and with the intergenerational poverty seen in Baltimore neighborhoods, thinking about and coordinating services to our young families are important. One of the biggest needs is for more information. EEDC hopes to recruit more partners to participate in this work, and we hope to collect more information about fathers to provide a better picture of the lives of our young children and also provide more context for interpreting participation rates, geographical access and participation as well as the impact on outcomes such as kindergarten readiness, attendance and academic performance.

Our analyses of the data show that approximately 30% of mothers who resided in Baltimore did not have a diploma or GED when their child was born. This is consistent with City Schools graduation rate, approximately 70% average over the last five years. This suggests that district efforts and recent success in increasing graduation rates will have an impact on later child rearing. This also suggests that multigenerational education opportunities, such as GEDs, college coursework, as well as job training programs, may be important support that can be provided to Baltimore parents. Research has shown that mother’s level of education—along with family income and parental occupation—is an important predictor of a child’s success in school (National Center for Education Statistics, 2012; Magnuson, 2007). Providing supports to parents may go far to improve outcomes for children, families, schools, the district and our city.
With regards to service use, approximately two-thirds of children born to mothers who resided in Baltimore at the time of their birth participated in one or more early education programs in the City, most commonly kindergarten. Also of note, about three-quarters of children enrolled in City Schools Pre-K and kindergarten were born to mothers who resided in Baltimore at the time of their birth. Many of these children took a common pathway, birth to kindergarten and first grade, and birth to Pre-K, kindergarten and first grade.

As seen in previous BERC research (Connolly and Olson 2012), there continues to be a number of children who enter kindergarten with no prior enrollment in Pre-K, even when they qualified for priority seats. These children often have lower rates of attendance, and readiness as measured by kindergarten readiness. Too often they start behind their peers and do not catch up. While efforts have been made to address this issue, more needs to be done.

One option is to provide universal Pre-K so that all 4-year olds have an opportunity for a structured learning experience to ensure they enter kindergarten ready to learn and be successful. If Pre-K were universal rather than targeted, the promotion and marketing of the program could change to target all Baltimore families.

Given the large number of children who are born in Baltimore who do not appear later on in our data, the number of potential Pre-K (and future kindergarten) enrollees is substantial. This group includes large numbers of mothers who may be interested in enrolling their children in a high-quality full-day program. For example, our data from a single year of births include over 300 mothers with some college education when their children were born and also eligible for medical financial assistance. An additional 300 mothers also had some college education but were not eligible for financial assistance. A portion of mothers also may be interested in enrolling their children in a full-day Pre-K program. Similarly, over 1,000 mothers who did not appear to enroll their children in City Schools had completed high school but not college when their children were born. All told, there appear to be approximately 1,600 mothers with a high school or some college education comprising the potential pool of City Schools enrollment. If a universal Pre-K program encouraged a third of these families to try out City Schools, that would increase the cohort’s enrollment by 500 students.

Over time we hope that the findings from this collaborative will lead to development of a single data system. As we learn and clarify data definitions, program services and which data elements are essential to measure program impact, we lay the groundwork for developing a single system that programs can use for registration and capturing service provision that will also provide leading and lagging indicators for programs, children and families.
References


Appendix A: Data Match Information for Both Cohorts

Children Born September 2, 2007 through September 1, 2008

Children Born September 2, 2008 through September 1, 2009
Appendix B: Pathways

**Family League**

Each public agency has "unknown origin" and/or "unknown destination as of Gr. 1" numbers. This page displays only those numbers which relate to the highlighted public agency.

**Maryland Family Network**

Each public agency has "unknown origin" and/or "unknown destination as of Gr. 1" numbers. This page displays only those numbers which relate to the highlighted public agency.
Maryland Family Network

Mom

- Average age was 21.1 years, with 49% under 20
- 2% were married
- 93% were African American, 4% were Latina, and 2% were White
- 75% had not completed high school, and none held college degrees
- Of high school non-completers, 43% were age 20 or older
- 18% reported smoking while pregnant
- 89% received Medicaid/MCHP

Baby

- Average birth weight was 6.6 lbs. with 14% less than 5.5 lbs.
- Average estimated gestation was 38.4 weeks with 12% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 57)
Family League

Mom
• Average age was 22.1 years, with 39% under 20
• 4% were married
• 90% were African American, 8% were White, and 2% were Latina
• 49% had not completed high school, and none held college degrees
• Of high school non-completers, 63% were age 20 or older
• 10% reported smoking while pregnant
• 94% received Medicaid/MCHIP

Baby
• Average birth weight was 6.7 lbs. with 12% less than 5.5 lbs.
• Average estimated gestation was 38.6 weeks with 12% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 58)
The Ark

Mom

• Average age was 23.3 years, with 33% under 20
• None were married
• 100% were African American
• 50% had not completed high school, and none held college degrees
• Of high school non-completers, 50% were age 20 or older
• 17% reported smoking while pregnant
• 100% received Medicaid/MCHIP

Baby

• Average birth weight was 6.1 lbs. with 33% less than 5.5 lbs.
• Average estimated gestation was 36.1 weeks with 36% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 12)
Head Start

Mom

- Average age was 24.0 years, with 24% under 20
- 14% were married
- 88% were African American, 7% were Latina, and 5% were White
- 33% had not completed high school, and 6% held college degrees
- Of high school non-completers, 61% were age 20 or older
- 10% reported smoking while pregnant
- 85% received Medicaid/MCHP

Baby

- Average birth weight was 6.8 lbs. with 12% less than 5.5 lbs.
- Average estimated gestation was 38.2 weeks with 14% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 2,152)
City Schools Pre-K

Mom

• Average age was 24.5 years, with 22% under 20

• 17% were married

• 85% are African American, 8% are White, and 6% were Latina

• 32% had not completed high school, and 9% held college degrees

• Of high school non-completers, 63% were age 20 or older

• 10% reported smoking while pregnant

• 78% received Medicaid/MCHP

Baby

• Average birth weight was 6.8 lbs. with 13% less than 5.5 lbs.

• Average estimated gestation was 38.3 weeks with 13% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 3,567)
City Schools Kindergarten

Mom

• Average age was 24.7 years, with 23% under 20

• 18% were married

• 83% were African American, 10% were White, and 6% were Latina

• 34% had not completed high school, and 11% held college degrees

• Of high school non-completers, 59% were age 20 or older

• 11% reported smoking while pregnant

• 77% received Medicaid/MCHP

Baby

• Average birth weight was 6.8 lbs. with 13% less than 5.5 lbs.

• Average estimated gestation was 38.3 weeks with 13% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2008. (N = 3,495)
City Schools Kindergarten With No Prior Services, Not FARMS Eligible

Mom

- Average age was 29.6 years, with 9% under 20
- 60% were married
- 49% were African American, 44% were White, and 4% were Latina
- 14% had not completed high school, and 54% held college degrees
- Of high school non-completers, 64% were age 20 or older
- 4% reported smoking while pregnant
- 33% received Medicaid/MCHP

Baby

- Average birth weight was 7.1 lbs. with 12% less than 5.5 lbs.
- Average estimated gestation was 38.5 weeks with 11% less than 37 weeks

Source: Baltimore City Health Department / Maryland Department of Health and Mental Hygiene, Vital Statistics for Babies Born to Baltimore Residents from 9/2/07 - 9/1/2010. (N = 378)