Baltimore City's Young Children: Prenatal to Five Experiences

2021 Baltimore Children's Cabinet Action Plan
Early Childhood Development

Brandon M. Scott
Mayor

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ECAC
BALTIMORE CITY
EARLY CHILDHOOD ADVISORY COUNCIL

ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

This report explores how services in Baltimore City might meet the needs of families with young children more effectively. We examine how families and children use early childhood services. We then look at how those services impact children's progress in school. We hope this report inspires us all to help Baltimore City's children succeed.

This report will help service providers

- reach and serve those who need support,
- track how each family with young children is doing,
- make their services even better, and
- improve children's outcomes for the long term.

We analyzed children's outcomes and how they used services from birth to kindergarten. Here are our key findings:

PREGNANCY AND BIRTHS IN BALTIMORE CITY

- Births in Baltimore City has decreased by 21% from 1996 to 2019. Baltimore City's decrease is greater than the decrease in the U. S. overall. The number of females ages 18-44 in Baltimore City has decreased as well, but not as much as the births.
- Black birth parents have much fewer births than other groups. Also, those with only a high school diploma and young adults ages 15-19 have much fewer births.
- Pregnant parents often have to go to the city center to find prenatal care, such as adolescent clinics and OB-GYN clinics. The city center has fewer births while more births take place in the south and east areas.
- Much fewer pregnant parents receive Women, Infant, and Child (WIC) supplemental nutrition assistance in 2010 than 2019.
- Also, many more pregnant parents have hypertension (high blood pressure)—a jump from about 4% in 2000 to 15% in 2019.
- In Baltimore City, the following are still below national averages:
    - full-term birth,
    - acceptable weight at birth (5 pounds or more), and
    - Prenatal care from first trimester.

[1] When possible, we use the term *birth parent* instead of *mother* to be inclusive of non-binary or transgendered individuals who have children.

EXECUTIVE SUMMARY

KINDERGARTEN IN BALTIMORE CITY

- To understand how young children are doing in kindergarten, we should use multiple methods, not just the Kindergarten Readiness Assessment (KRA).
- Over the last 20 years, on average, about 29% of Baltimore City kindergarteners were chronically absent – missing more that 10% of school days. In the 2018-2019 school year, about 38% were chronically absent. In Baltimore City, students with chronic absenteeism tend to not show readiness for school.
- From 2014 to 2019, on average, KRA scores indicated about 41% of Baltimore City kindergartners showed they are ready for school.
- On the KRA, girls tend to score higher than boys. Hispanic children are less likely to show they are ready for school. English language learners are less likely to show they are ready for school. Finally, children with Individualized Education Programs (IEPs) were less likely to be ready for school as well.

BIRTH TO KINDERGARTEN: CHILDREN'S ACCESS TO PUBLIC EARLY CHILDHOOD SERVICES

- Children and families with greater health risks used services, such as home visiting, Baltimore City Health Department, Early Head Start, Head Start, and City Schools more often.
- Children who attended Head Start or Public Pre-K showed
    - better school readiness on the KRA,
    - better attendance from kindergarten to fifth grade, and
    - better on-time grade promotion in the third grade and fifth grade.
- We found these positive results, especially among children
    - whose mothers had medical assistance at birth,
    - who lived in concentrated poverty areas, and
    - whose mothers were younger than 19 years old at birth.
- In order to continue examination of children's access to early childhood services, development of the city's comprehensive data archive that incorporates all public and private services available for children and families is needed.

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INTRODUCTION

In March 2021, the Baltimore Mayor's Office of Children and Family Success launched the 2021 Action Plan to support Baltimore City's children and youth. One action in the plan was to:

> *Inform improvement of early childhood development services and outcomes by linking cross-sector data, analyzing families' access to comprehensive resources, and publishing a report of the early childhood landscape in Baltimore.*

As such, we aim to identify potential gaps between the city's services and families' needs to hold us all accountable for children's success. We hope this report helps early childhood service providers

- serve equitably,
- track trends for families with young children,
- enhance quality, and
- improve outcomes over time.

> *63% of children enter kindergarten in Baltimore City Public Schools without a foundation for academic success. The deep racial and economic inequities that drive our city's persistently high rates of preterm births, low birth weights and childhood trauma, coupled with families' lack of access to quality childcare and healthy food, all contribute to children starting school unready to learn.*
>
> *-Children's Cabinet 2021 Action Plan-*

We all have the responsibility to make sure that all Baltimore City children are prepared for kindergarten. In this report, we use a *social determinants of health* framework (Figure 1) to describe experiences of children and families in Baltimore City. This framework shows a holistic view of health and its causes, which is consistent with the Action Plan's goal to link data across sectors.

Figure 1. Social Determinants of Health Framework

Source: CDC. (2021, February 18). CDC - Social Determinants of Health—STLT Gateway. Centers for Disease Control and Prevention[1].

[1] https://www.cdc.gov/publichealthgateway/sdoh/index.html

In Baltimore, access to education, health services, and safe and well-resourced neighborhoods, among other social determinants of health, are divided along lines of race and income. As of November 2019, Baltimore City had 493 licensed family-based programs, 289 group centers, and 24 pre-kindergarten programs providing early childhood education (ECE) for as many as 19,947 children (Holleman, 2021). At that time, the city had ECE available for 12% of children under age 2 and 48% of children under age 5. For families with the median income in Baltimore ($50,379), paying for ECE took up 30% of their expenses.

With COVID-19, access to quality ECE decreased sharply. As of January 2021, only 71% of licensed family care programs and 56% of licensed group care programs, including Head Start, remained in operation. Growing Hispanic communities in south and southeast areas of the city face limited available childcare. Overall, inadequate investment in ECE staff wages, staff development, and program coverage has contributed to inadequate care quality in areas where children need it most (Holleman, 2021).

The experiences of Baltimore's children in ECE, and their lives, begin at birth. The birth rate among women is estimated to be 13.0 per 1,000. Among teens (15-19 years old), this number is much higher at 27.8 per 1,000 (Baltimore City Health Department, 2017). Among children born in Baltimore, 12.2% were low birthweight in 2019 (Maryland Department of Health Vital Statistics Administration, 2019). Also, life expectancy is estimated to be 73.6, which falls below the national average. Heart disease, cancer, and stroke are among the leading causes of death. Regarding the neighborhoods and built environment, vacant lot density is estimated at 677.3 per 10,000 housing units. Vacant building density is estimated 562.4 per 10,000 housing units. Lead paint violations is estimated 9.8 per 10,000. These conditions continue to impede quality health outcomes for Baltimore children and families.

Across Baltimore City, approximately half of the adults have attained a high school degree, while nearly 30% have a bachelor's degree. Furthermore, 31% of children live below the poverty line (Baltimore Neighborhood Indicators Alliance – Jacob France Institute, 2019). Recent investments in Baltimore residents and neighborhoods include

- grants for reproductive health education,
- training city employees in trauma-informed care,
- the Baltimarket Program for healthy corner stores,
- and addressing teen sexual and maternal health through the B'more for Healthy Babies program.

The efforts demonstrate the city's work to improve the health and safety of the current and next generation of adults (Baltimore Department of Health, 2020). The economic stability of every community begins with the health and education of its people. Therefore, understanding the role of ECE throughout the city is part of developing a healthier Baltimore. This report explores potential opportunity gaps between services provision and the needs of individual families with young children.

CHAPTER 1

PREGNANCY AND BIRTHS IN BALTIMORE CITY

This chapter explores birth statistics in Baltimore City over the last two decades. Birth data have important implications for every aspect of our city's health, from bus lines to grocery stores. Birth data are critical for institutions, such as hospitals and schools, whose number, size, and service delivery all depend on the particulars of a population. Births are among the most critical factors in a city's economic stability, signaling whether we will have a sustainable workforce and our future needs. The number of babies born, and their demographic groups, help us track trends and cultural shifts. Moreover, they signal future opportunities and needs. For instance, as the largest group of immigrants to the U.S. are from Central and South America (Budiman et al., 2020), a growing number of babies born to Spanish-speaking parents may signal *opportunities* associated with newcomers as well as a *need* for dual language speakers in school systems, health care networks, and other institutions.

As described in the introduction, we use a *social determinants of health* framework to describe birth statistics in Baltimore. We organized the birth data into the following categories:

- number of births,
- poverty,
- mother's level of education attainment,
- race/ethnicity[2],
- births to adolescents ages 15-19, and
- health outcomes for babies and birthing parents.

Data Sources

We used data from the Baltimore City Health Department, the Maryland State Department of Health, and the Baltimore Neighborhood Indicators Alliance – Jacob France Institute. Most sources are publicly available sources. Table and figure notes state when data are from a non-publicly-available source. The Baltimore City Health Department provided the non-publicly-available source data.

The data this study provide multiyear trends to help understand changes over time in various birth characteristics. In this chapter, we aimed for at least a 10-year comparison, as that provides a meaningful comparison. For some tables and figures, especially for

[2] Following Iruka et al. (2021), we use the term Black to refer to anyone whose ancestral heritage is from Africa, including those who are descendants of enslaved Africans as well as Afro-Caribbean and African immigrants. We use the term Latine to refer to those with a Latin American cultural background. We use Latine over the gender-inclusive Latinx because Iruka et al. (2021) pointed out that Latinx is unpronounceable in Spanish.

city-level data, data availability allowed us to provide summaries for 20 years or more. For others, especially for community statistical area (CSA)-level data, availability allows only a 10-year comparison. Finally, when data were available for fewer years, such as household poverty data from 2015-2019, we present as many years as possible.

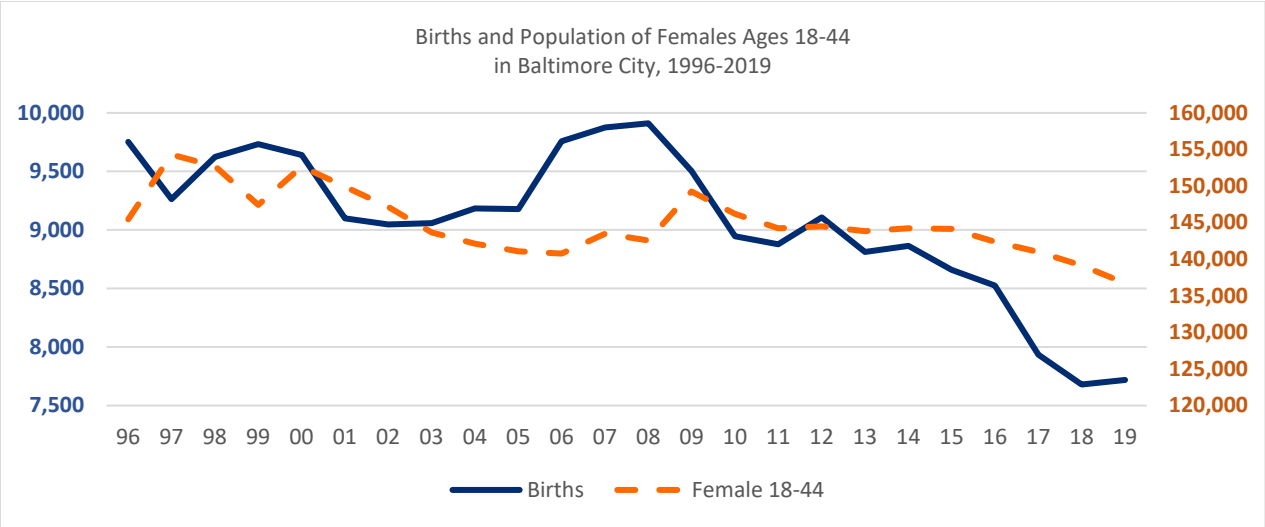
Most categories show birth statistics over time, in tables or figures or both. For many categories we show geographic trends as well. Our geographical unit is the U.S. Census-designated CSA, of which there are 55 in Baltimore City. All CSAs reflect the designation from the 2010 Census. We chose CSAs because the larger size of quadrants or octants obscures meaningful neighborhood diversity, and the smaller size of U.S. Census tracts, of which there are more than 600 in Baltimore City, are difficult to read and interpret. Publicly available data sources also often aggregate at the CSA level.

Births in Baltimore City

We first analyzed the trends of births and population changes in Baltimore. Figure 1 shows the number of births and the population of females ages 18-44 in Baltimore City from 1996 to 2019. For births, the trend is mostly downward, from 9,752 in 1996 to 7,720 in 2019, with a peak of 9,911 in 2008. The change in births between 1996 and 2019 is a decrease of **21%**.

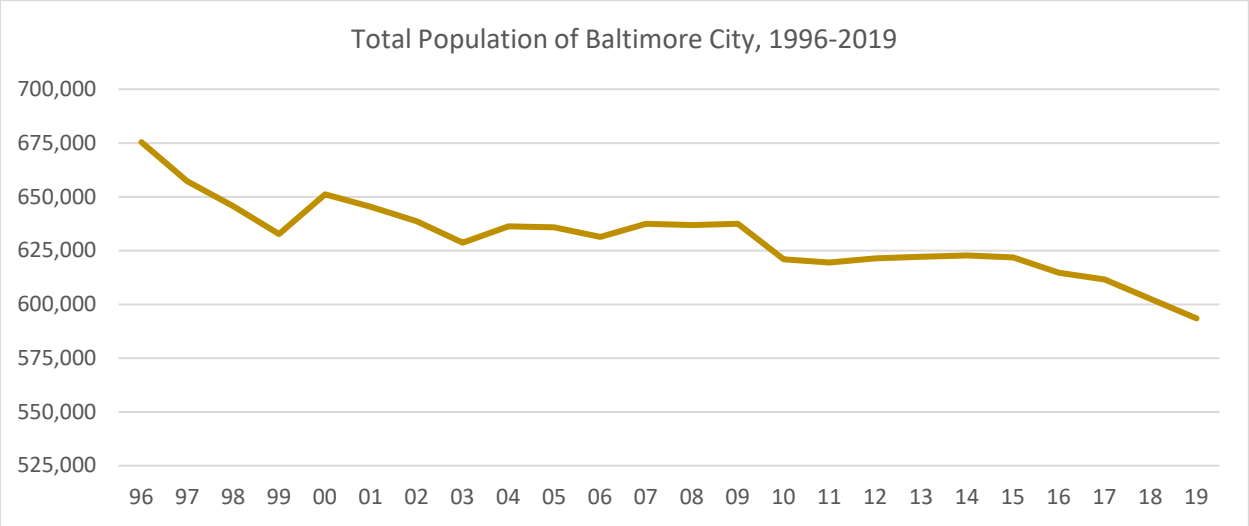
The data for females aged 18-44 do *not* suggest this decline in birth is due to a similar decline in female residents of child-bearing age. The change in the female 18-44 population between 1996 and 2019 is a decrease of 6%. The female 18-44 population more closely resembles the overall population of Baltimore City (Figure 3), which has had a mostly downward trend since 1996. The total population decrease between 1996 and 2019 is **12%**. Therefore, the decline is births is greater than both the decline in the female 18-44 and the total population decline.

Figure 2. Births and Population of Females Ages 18-44 in Baltimore City, 1996-2019



Source: Maryland Department of Health, Vital Statistics and Reports

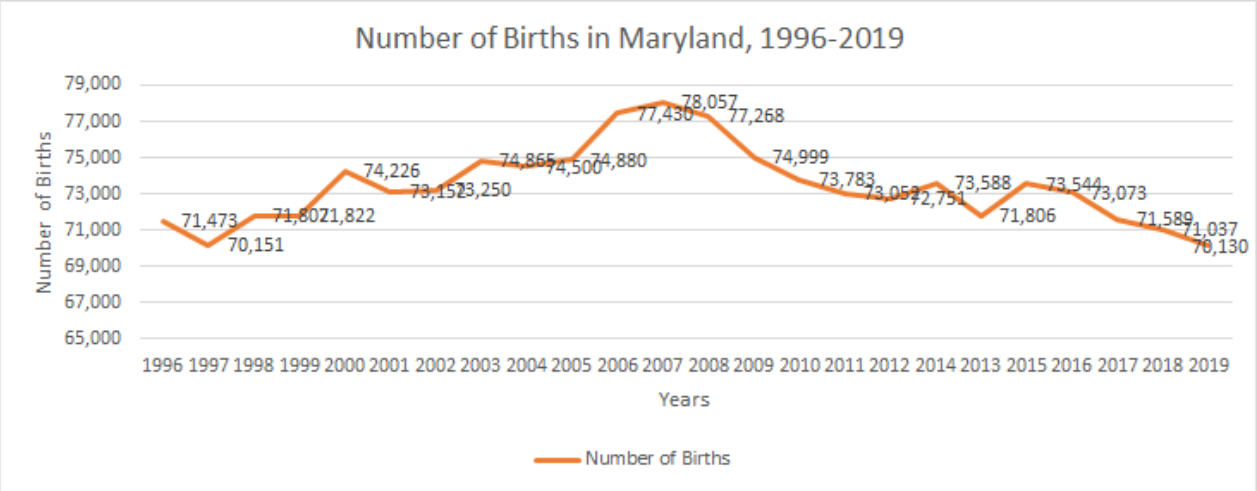
Figure 3. Total Population of Baltimore City, 1996-2019



Source: Baltimore City Health Department

Nationally, 2020 marked the sixth straight year of decline and had the lowest birth rate and number of births since 1979 (Hamilton et al., 2021). As shown in Figure 4, the Maryland trend follows an inverted U shape, with a peak in 2007, and mostly a decline since. The difference in number of births between 1996 and 2019 is a reduction of only 2%. Thus, Baltimore City's birth trends are within a national context of decline, but still are steeper and longer-lived, and out of sync with Maryland as a whole.

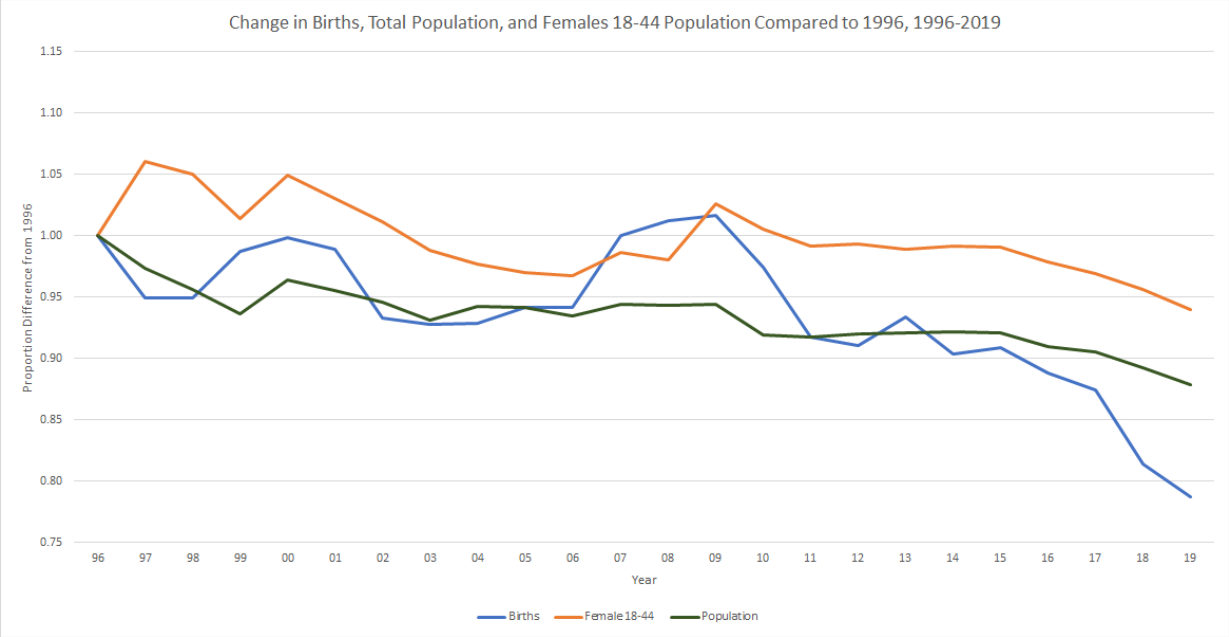
Figure 4. Maryland Births, 1996-2019



Sources: 1996-2016, opendata.maryland.gov; 2017-2019, Maryland Department of Health Vital Statistics and Reports

Figure 5 shows Baltimore City birth trends by comparing each year's data to its 1996 value. For instance, the 1997 value for females 18-44 is about 6% greater (just above the 1.05 mark) than the 1996 value. The 2019 data show that total births has had a steeper decline than the other two, with the total less than 80% of its 1996 value. The figure highlights that births have had a few periods of diverging from total population trends, most distinctly the "bubbles" in 1997–1999 and 2006–2009 and a steeper decrease since 2014, which has only steepened since 2017.

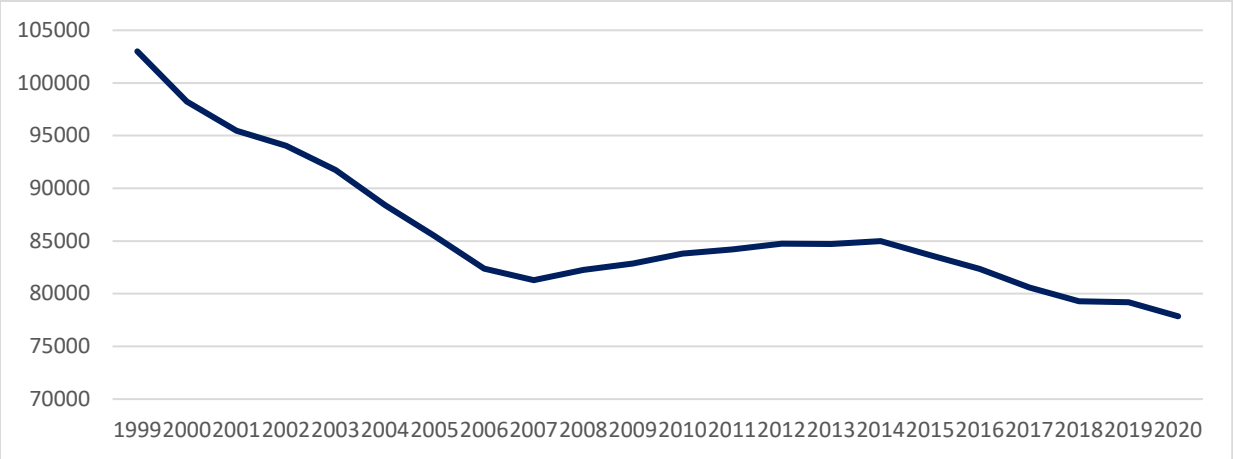
Figure 5. Change in Births, Total Population, and Females 18-44 Population Compared to 1996, 1996-2019



Sources: Baltimore City Health Department, Maryland Department of Health Vital Statistics and Reports

Note that the decrease in births tracks with a decrease in Baltimore City Public Schools (City Schools) enrollment (see Figure 6). The decreasing birth numbers are a concern for many city institutions.

Figure 6. Baltimore City Public Schools Enrollment, 1999-2020



Source: Maryland Department of Education

We also analyzed the number of births by location in the city. Figure 7 shows change in number of births between 2008 and 2018. Of the city's 55 CSAs, five had an increased births, two stayed the same, and 48 had decreased birth. This reflects Baltimore City's overall decrease, with 23% fewer births in 2018 than 2008. Indeed, the mode of CSAs' decreased was 29%, and the city's average was a decrease of 21%.

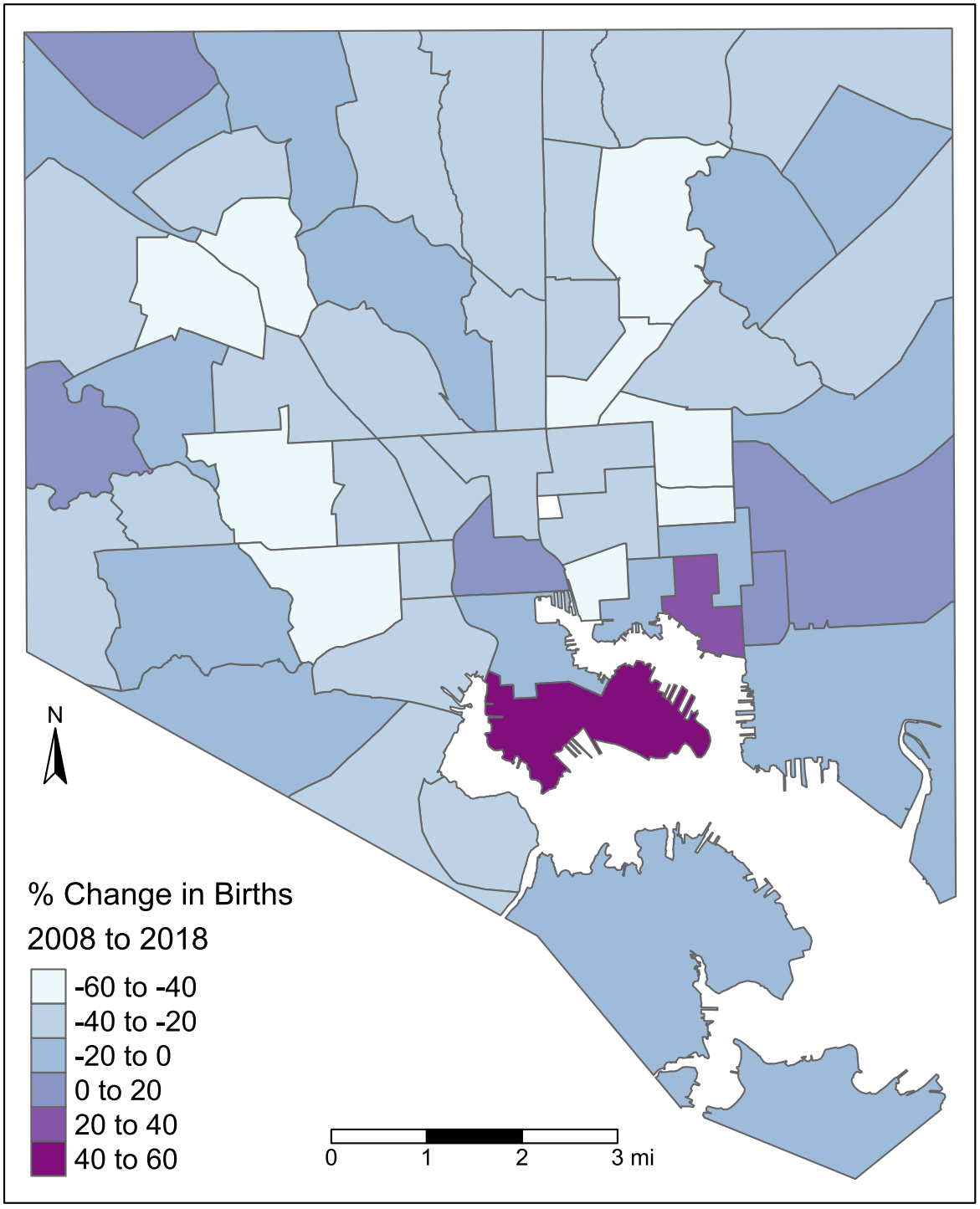
The CSA with the greatest relative increase in births was South Baltimore, whose number of births rose by more than 50%. As Figure 7 shows, areas of growth are relatively concentrated: Most (South Baltimore, Canton, Orangeville/East Highlandtown, and Highlandtown) are in the southeast quadrant of the city, near the bay and stretching north and east. This region overall has a large and growing Latine/Hispanic population (Filomeno, 2017), though Canton, Highlandtown, and South Baltimore saw a decrease in the proportion of Latine/Hispanic births between 2008 and 2018 (see Appendix Table 1.4). Only Cross-Country/Cheswolde, with the fourth-highest growth at 15%, is out of this region, located in the far northwest corner of the city.

In contrast, Figure 7 shows that the CSAs with the greatest decreases (Harbor East/Little Italy; Southern Park Heights; Southwest Baltimore; Midway/Coldstream; Clifton, Berea) are geographically disparate. Harbor East/Little Italy is south, close to growth CSAs, while Southern Park Heights is in the northwest quadrant of the city, Southwest Baltimore is in the southwest, and Midway/Coldstream and Clifton-Berea are more central and east.

The growth and decrease trends describe a city that is declining overall despite concentrated pockets of growth in the south and east. Appendix Table 1.1 show percentage change in births between 2008 and 2018 for each CSA. Below, we provide a map with CSA names.

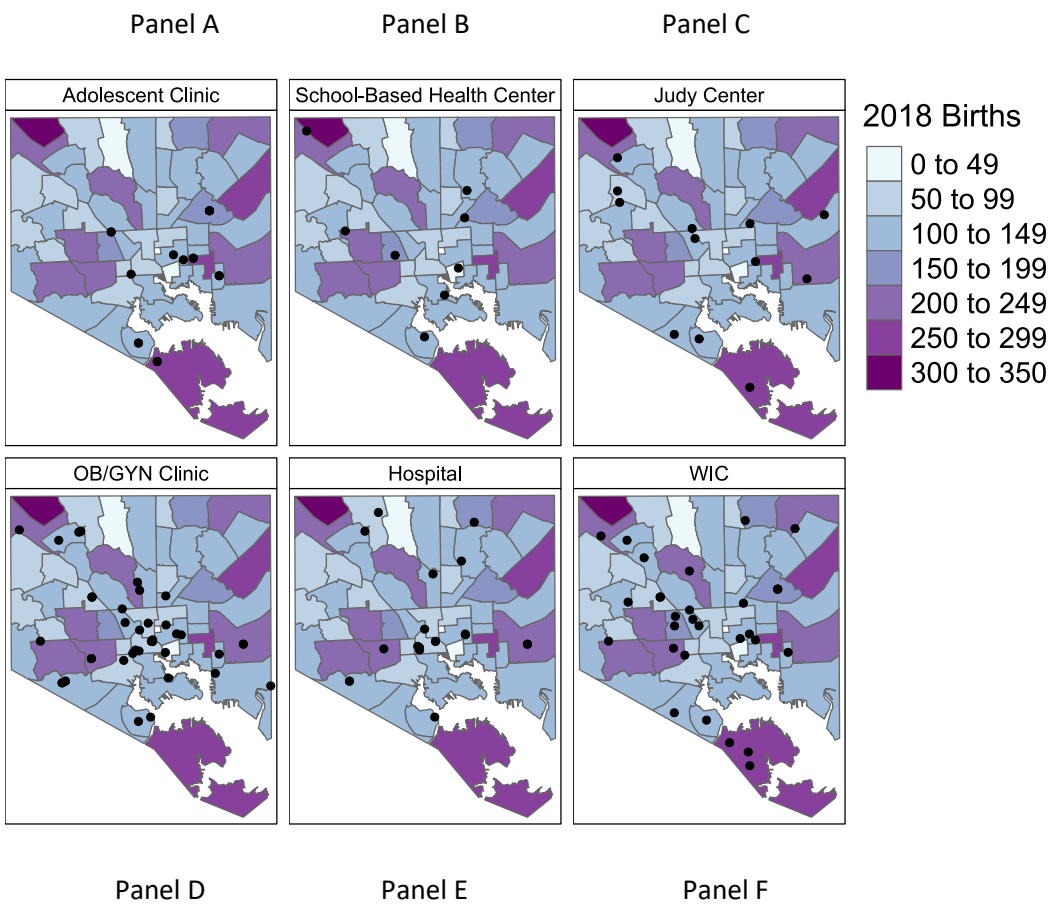
Source: Baltimore Neighborhood Indicators Alliance – Jacob France Institute (BINA-JFI). Community Statistical Areas (CSA) are aggregations of census tracts used by BNIA and the Baltimore City Planning Department to measure and describe neighborhood conditions (https://bniajfi.org/faqs/). The CSA map is reprinted with permission from BINA-JFI.

Figure 7. Percent Change in Number of Births by Baltimore City Community Statistical Area, 2008–2018



Source: Baltimore City Health Department

Figure 8. Baltimore City Number of Births by Community Statistical Area 2018 and Service Provider Locations



Source: Baltimore City Health Department for births, adolescent clinics, OB/GYN clinics, and School-Based Health Centers[3]

Note: Greater Baltimore Medical Center is north of city limits and has OB-GYN, labor and delivery, perinatal care, postpartum care, pediatrics, and family care, and is a viable and proximal options for families in the northern areas of the city.

Figure 8 shows 2018 births by CSA, with health care locations overlaid. Panels A and B show adolescent clinics and school-based health clinics, which dispense contraception and provide other health care services. Panel C shows Judy Centers, which school-based sites providing wraparound services for families with children ages prenatal to 5 (including referrals to prenatal care). Panel D shows OB-GYN clinics, which dispense contraception and other health care services. Panel E shows hospitals that have birthing centers and/or emergency services. Note that Greater Baltimore Medical Center (GBMC), not featured on this map, is less than two miles north of city limits and has services including OB-GYN, labor

[3] Hospitals: https://www.officialusa.com/stateguides/health/hospitals/maryland.html; WIC sites: https://phpa.health.maryland.gov/wic/Pages/wic-apply.aspx#contact; Judy Centers: https://earlychildhood.marylandpublicschools.org/system/files/filedepot/4/judy_center_contact_list.pdf

and delivery, perinatal care, postpartum care, pediatrics, and family care. Panel F shows WIC (Women, Infant, and Child) program sites, which provide supplementary nutrition funding for low-income families.

The most striking feature of Figure 8 is the central concentration of medical services. The center part of the city—neighborhoods such as Midtown, Greenmount East, Poppleton/The Terraces/Hollins Market, Downtown/Seton Hall, Washington Village/Pigtown, and Harbor East/Little Italy—have among the lowest births despite (or perhaps because of) having the highest concentration of services. Even with GBMC, this may keep sexually active, pregnant, and/or childbearing people far from the center of the city from getting needed care. To be sure, roads, highway systems, transit lines, and traffic patterns may all make central locations the most efficient, even for residents on the outer reaches. Still, it signals a need for greater research into how those in, for instance, Greater Rosemont, Orangeville/East Highlandtown, and Curtis Bay access care. Moreover, Panel B shows that the easternmost school-based clinic is in Northwood, meaning the whole far eastern region of the city (including Patterson Park, Highlandtown, and Orangeville) lacks this service type. As these regions represent areas of population growth, stakeholders may want to explore adding or relocating services to them.

Also striking is the lack of services, except for WIC sites, in the Brooklyn/Curtis Bay/Hawkins Point area. Certainly, large portions of that CSA are industrial, sanitation, and trucking establishments. Still, Brooklyn/Curtis Bay/Hawkins Point has large swaths of residences and few health care locations. The CSA's teen birth rate, at 61.5 per 1,000, was the highest in the city in 2019 (Baltimore Neighborhood Indicators Alliance, 2020), and its infant mortality rate was 10.48 per 1,000 in 2018 (Baltimore Neighborhood Indicators Alliance, 2020), which is in the higher half of CSAs in the city. Given the relatively high number of births in this area, the availability of health care facilities warrants attention. The northeast quadrant of the city, likewise, has a dearth of services, though some families there may use GBMC.

Finally, Panel F shows that WIC locations, appropriately, tend to be in CSAs with higher births. (An exception is Cross-Country/Cheswolde, in the top left, which has relatively wealthy residents who are less likely to be eligible for or need WIC).

Birth and Material Poverty

Material poverty is a critical health factor, as it affects all social determinants of health. Materially disadvantaged individuals often have less access to high-quality education (Peske & Haycock, 2006), health care (Chokshi, 2018), public transportation (Blumenberg, 2002; Ong & Blumenberg, 1998; Sanchez, 2008), and the high-wage jobs that support economic stability (Cove et al., 2008; Hess, 2005). Moreover, individuals living in areas with concentrated material poverty are more likely to experience threats to safety and health, such as high crime (Pratt & Cullen, 2005), air pollutants (Schweitzer & Zhou, 2010), and a lack of nutritious food (Curley, 2010; McGahey, 1986; Oreopoulos, 2003). Also, those in materially disadvantaged communities are more likely to experience mental health problems (Baker et al., 2016; Curl et al., 2015; Pevalin et al., 2017). Further, children born in high-poverty areas are more likely to be unprepared for kindergarten (Reardon & Portilla, 2016), face health problems such as

asthma (Assari & Moghani Lankarani, 2018; Council on Community Pediatrics, 2016), be exposed to lead (Benfer, 2017), and demonstrate behavior problems (Qi & Kaiser, 2003).

High-quality interventions may mitigate these negative outcomes. For instance, food benefits such as SNAP (Supplemental Nutrition Assistance Program) and WIC (Women, Infants, and Children) are associated with an improved home environment (Ettinger de Cuba et al., 2019; Hoynes et al., 2017; Kim, 2016). Early intervention is associated with better outcomes for children with special needs (NECTAC, 2011; Pasco, 2018). Additionally, educational experiences and other supports for parents (e.g., Head Start, parenting programs) are associated with family stability and health (Garces et al., 2000; Ludwig & Miller, 2007; Sabol & Chase-Lansdale, 2015). Thus, understanding how many and where babies are born in poverty can inform agencies about where to deliver services to support families, and ultimately improve child outcomes.

Figure 9 describes the proportion of family households in poverty for each CSA with dot sizes representing number of births. Areas with darker shades and high numbers, such as those in the southernmost and central areas of the city, may represent highest need. For instance, Oldtown/Middle East has more than 40% of households in poverty and a middle-range number of births, at 114. Although Poppleton/The Terraces/Hollins Market has fewer births, at 66, it is geographically much smaller and has a poverty level of greater than 40%. Moreover, surrounding Poppleton/The Terraces/Hollins Market are three CSAs with high births and greater than 30% of households in poverty: Southwest Baltimore (214 births), Sandtown-Winchester/Harlem Park (187 births), and Upton/Druid Heights (145 births). South Park Heights, in the northeast, is similar, with greater than 30% of families at or below the poverty level and 148 births. Other than the low-poverty core of Midtown and Downtown, and the high-poverty areas south of the harbor, the map describes a low-poverty outer ring, with poverty growing more concentrated while moving inward to the core.

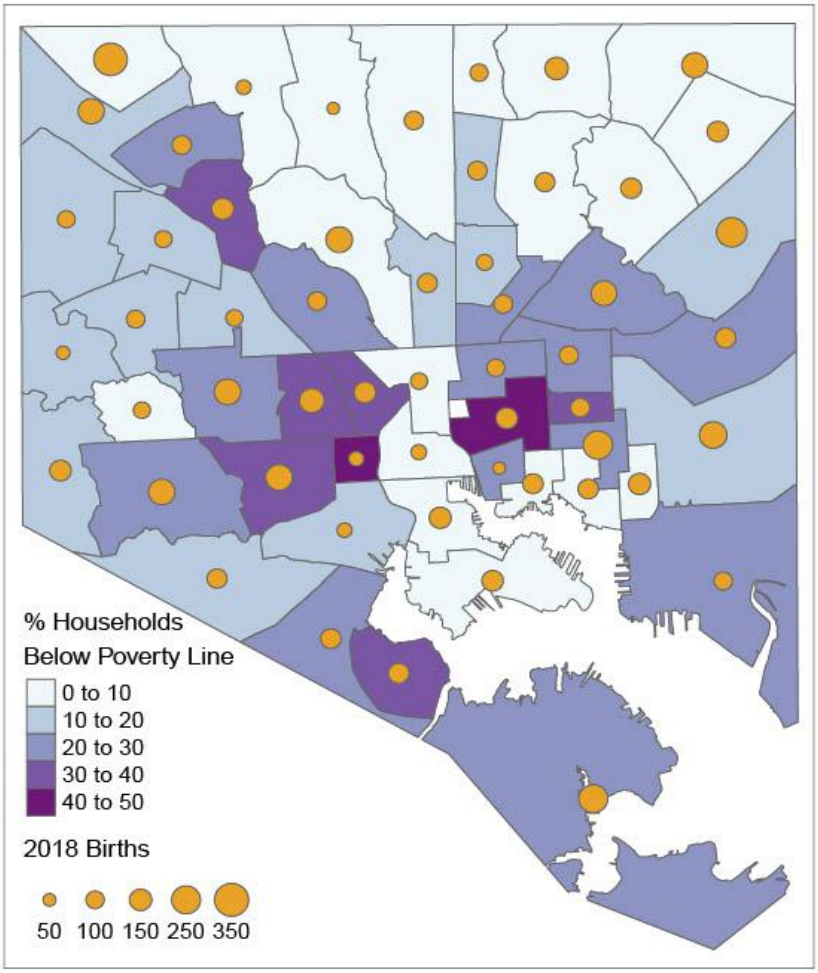
Table 1 shows the percent of children and households in poverty for the years 2015 to 2019. Each year's percentage is derived by a five-year average of American Community Survey results (Baltimore Neighborhood Indicators Alliance – Jacob France Institute, 2021). Between 2015 and 2019, 35 of 55 CSAs experienced a decline in the proportion of children in poverty, 17 experienced an increase in the proportion of children in poverty, and three stayed the same. The CSAs that experienced the *largest decreases of proportion of children in poverty* between 2015 and 2019 are Southern Park Heights (21 percentage points), Edmondson Village (19), Dickeyville/Franklintown (17), Greater Charles Village/Barclay (16), and Harbor East/Little Italy (16). The CSAs that experienced the *largest increases of proportion of children in poverty* were Greater Mondawmin (16), Patterson Park North & East (13), The Waverlies (11), Greenmount East (8), and Greater Govans (7). The averages are high, with 31% of children below the poverty line in 2015 and 28% in 2019. The national average in 2020 was 16% (Shrider et al., 2021).

Between 2015 and 2019, 44 of 55 CSAs experienced a decline in the five-year average proportion of households in poverty, nine experienced an increase, and six stayed the same. The CSAs that experienced the *largest decreases of proportion of households in poverty* between 2015 and 2019 are Dickeyville (15 percentage points), Harbor East/Little Italy (13), Penn North/Reservoir Hill (12) and Greater Charles Village/Barclay (11), and Oldtown/Middle East (9). The CSAs that experienced the

largest increases of proportion of households in poverty were Greater Rosemont (5), the Waverlies (4), Belair-Edison (4), Claremont/Armistead (3), and Madison/East End (2). The changes skew positive, with most CSAs experiencing a *decrease* in the number of households in poverty, and the magnitude of those changes larger. Still, the averages are high, with 16% of Baltimore households in poverty in 2019. The national average for all families in 2020 was 8.7% and families with children was 15.7% (Shrider et al., 2021).

One crucial limitation is that Baltimore City has 278 distinct neighborhoods (Goodman, 1985) and has high variability in income, crime, vacancies, and other factors on even a block-to-block basis. Thus, CSAs are large and blunt geographical units, unable to reflect the city's nuance. Still, the map may be useful as a starting point, able to inform areas that warrant a closer look at outreach and provision of services for young children and their families.

Figure 9. CSA Poverty Level and Number of Births, 2018



Source: Baltimore Neighborhood Indicators Alliance – Jacob France Institute, from the American Community Survey years 2011-2015 (for 2015), 2012-2016 (for 2016), 2013-2017 (for 2017), 2014-2018 (for 2018), 2015-2019 (for 2019)

Table 1. Proportion of Baltimore City Children and Households Below Poverty Line by CSA 2015-2019

CSA	Percent of Children Below Poverty Line					Percent of Households Below Poverty Line				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Allendale/Irvington/S. Hilton	39	35	33	35	33	24	21	21	23	19
Beechfield/Ten Hills/West Hills	19	21	24	22	15	11	12	10	11	9
Belair-Edison	37	36	35	40	41	19	20	20	23	23
Brooklyn/Curtis Bay/Hawkins Point	45	46	46	40	41	28	26	24	22	25
Canton	5	3	4	5	5	3	2	4	2	2
Cedonia/Frankford	23	21	20	16	18	17	15	12	10	11
Cherry Hill	63	61	57	59	58	46	41	39	39	38
Chinquapin Park/Belvedere	16	18	23	12	12	9	10	10	7	8
Claremont/Armistead	33	34	35	34	32	21	24	24	25	24
Clifton-Berea	35	48	48	50	40	24	29	28	28	19
Cross-Country/Cheswolde	10	10	13	15	15	8	7	10	9	8
Dickeyville/Franklintown	29	30	34	20	12	21	18	17	12	6
Dorchester/Ashburton	35	38	43	38	35	19	15	17	16	15
Downtown/Seton Hill	12	13	13	8	6	5	7	7	6	4
Edmondson Village	40	27	25	24	22	16	11	9	10	10
Fells Point	13	7	7	11	8	6	4	3	5	6
Forest Park/Walbrook	46	44	48	40	38	20	19	19	18	17
Glen-Fallstaff	28	31	27	26	29	20	20	18	17	17
Greater Charles Village/Barclay	42	45	40	33	26	24	26	19	18	13
Greater Govans	39	43	47	44	46	21	19	20	18	21
Greater Mondawmin	29	29	37	46	44	18	17	19	19	17
Greater Roland Park/Poplar Hill	8	8	4	3	2	4	4	2	2	1
Greater Rosemont	44	46	43	47	47	21	24	24	25	26
Greenmount East	38	38	36	39	46	26	24	24	23	26
Hamilton	13	16	13	8	7	9	11	9	6	6
Harbor East/Little Italy	49	40	33	33	33	38	31	27	29	25
Harford/Echodale	17	19	18	14	9	9	9	10	9	6
Highlandtown	15	21	15	15	22	10	9	7	6	9
Howard Park/West Arlington	31	33	22	18	19	20	17	15	11	13
Inner Harbor/Federal Hill	18	9	8	7	7	8	3	2	2	3
Lauraville	15	16	17	12	14	9	10	7	6	6
Loch Raven	17	17	6	12	17	12	12	5	7	9

CSA	Percent of Children Below Poverty Line					Percent of Households Below Poverty Line				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Madison/East End	59	59	56	55	56	33	32	34	34	34
Medfield/Hampden/Woodberry/Remington	14		8	7	6	7	7	6	6	5
Midtown	8	18	16	12	13	8	8	5	6	7
Midway/Coldstream	48	45	49	41	36	26	24	23	24	24
Morrell Park/Violetville	13	18	15	11	18	13	15	13	12	11
Mount Washington/Coldspring	8	6	4	5	2	5	4	2	2	3
North Baltimore/Guilford/Homeland	5	6	4	3	4	6	6	3	4	5
Northwood	14	12	10	9	10	8	8	7	6	4
Oldtown/Middle East	60	60	55	56	50	44	43	40	40	36
Orangeville/East Highlandtown	24	22	22	19	13	13	14	13	13	12
Patterson Park North & East	42	37	41	50	55	26	23	22	25	24
Penn North/Reservoir Hill	43	40	47	43	38	29	29	26	20	17
Pimlico/Arlington/Hilltop	40	42	39	37	32	17	19	19	20	18
Poppleton/The Terraces/Hollins Market	66	65	57	59	51	49	48	45	43	41
Sandtown-Winchester/Harlem Park	60	55	57	59	61	36	32	35	36	36
South Baltimore	3	0	0	0	0	4	1	1	0	0
Southeastern	52	52	53	46	42	26	29	30	28	27
Southern Park Heights	51	50	48	42	30	36	35	32	31	30
Southwest Baltimore	51	48	49	46	51	33	36	36	32	34
The Waverlies	27	37	44	42	38	14	18	21	19	19
Upton/Druid Heights	60	64	65	61	67	47	44	43	40	42
Washington Village/Pigtown	37	43	34	28	38	25	25	23	20	25
Westport/Mount Winans/Lakeland	40	39	40	45	43	24	20	22	24	24

Source: Baltimore Neighborhood Indicators Alliance – Jacob France Institute, from the American Community Survey years 2011-2015 (for 2015), 2012-2016 (for 2016), 2013-2017 (for 2017), 2014-2018 (for 2018), 2015-2019 (for 2019)

Birth and Mother's Educational Attainment

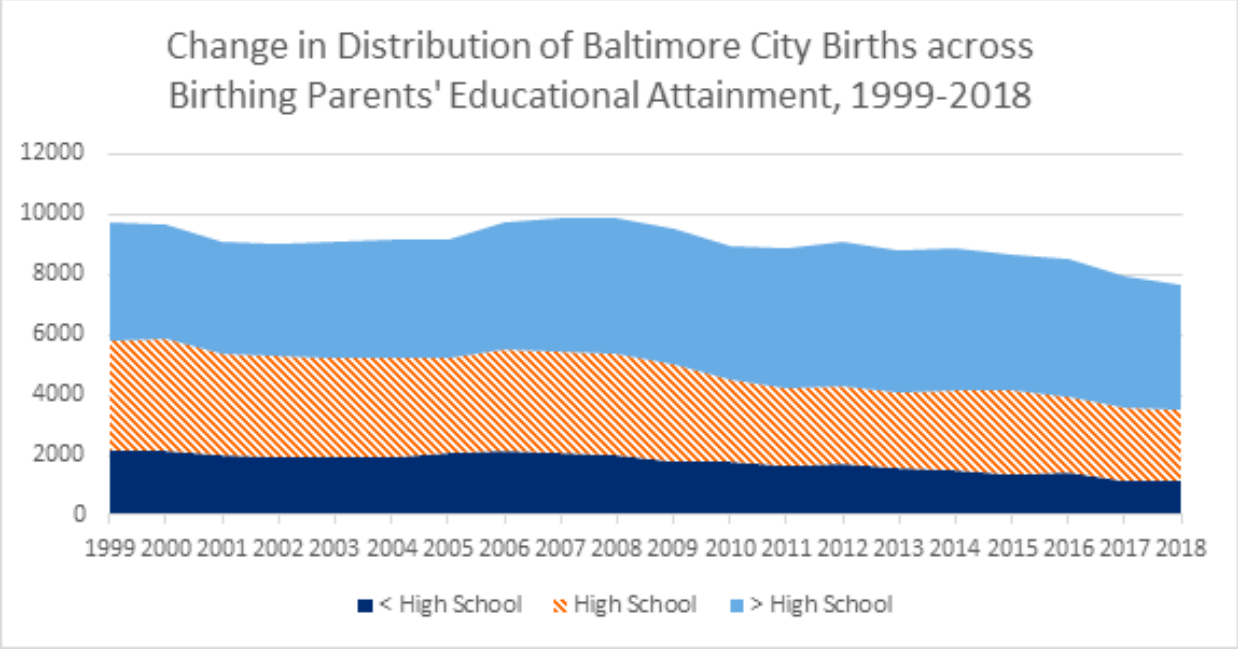
Mother's level of educational attainment is an important factor in children's well-being. Children whose mothers have higher levels of education are more likely to be in good physical health (Desai & Alva,

1998) and have high academic achievement (Magnuson, 2007) and less likely to experience cognitive development delays (Patra et al., 2016). Mothers with more education are also more likely to enroll their children in early care and education programs (Greenberg, 2011). Because educational attainment is closely related to income, children whose mothers have low levels of education are more likely to experience poverty and its attendant risks and challenges. Thus, public health and education officials and practitioners often advocate for youths to delay parenthood until achieving education milestones (e.g., Hoffman & Maynard, 2008).

Between 1999 and 2018, average educational attainment for Baltimore City residents increased. In 2000, 68.4% of Baltimore City adults had a high school diploma/GED or greater attainment (Brookings Institute, n.d.), while in 2019, that figure was 85.2% (U.S. Census, 2019). In that time, the proportion of births to mothers with *lower* levels of educational attainment *decreased*, while the proportion of births to mothers with *higher* levels of educational attainment *increased*.

Figure 10 describes birth trends across three levels of education between 1999 and 2018 (see the full data in Appendix Table 1.2). The proportion of births to those with a high school diploma/GED is dominant and grows over time. The proportions of births for lower levels of educational attainment decrease over time.

Figure 10. Change in Distribution of Baltimore City Births Across Birthing Parents' Education Attainment Level, 1999-2018

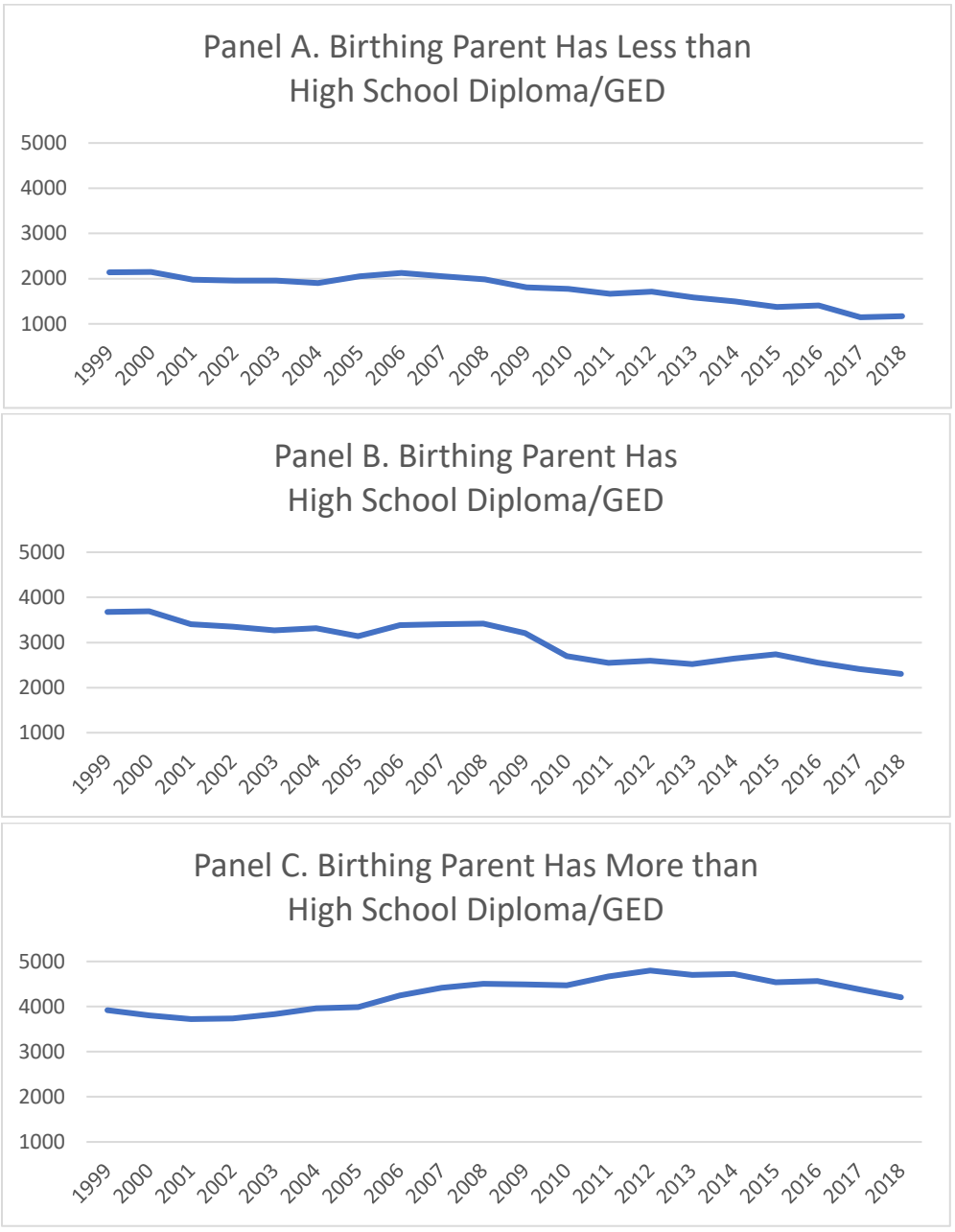


Source: Baltimore City Health Department

Figure 11 shows subgroup trends from 1999 to 2018. In that time, the total number of babies born in Baltimore reduced by about 2,000, from about 9,700 to about 7,700. Panels A and B of Figure 11 show that this reduction was driven by the less educated sub-groups. At the same time, the number of births to mothers with some post-secondary education mostly increased, rising from 3,919 in 1999 to a peak of

4,799 in 2012, from which it fell to 4,206 in 2018. Specifically, the proportion for those with less than a high school diploma fell from about 22% to 15% (Panel A), for those with a high school diploma or GED fell from about 38% to 30% (Panel B), and for those with more than high school rose from about 40% to 54% (Panel C).

Figure 11. Within-Group Birth Trends Across Mothers' Education Attainment Levels, 1999-2018

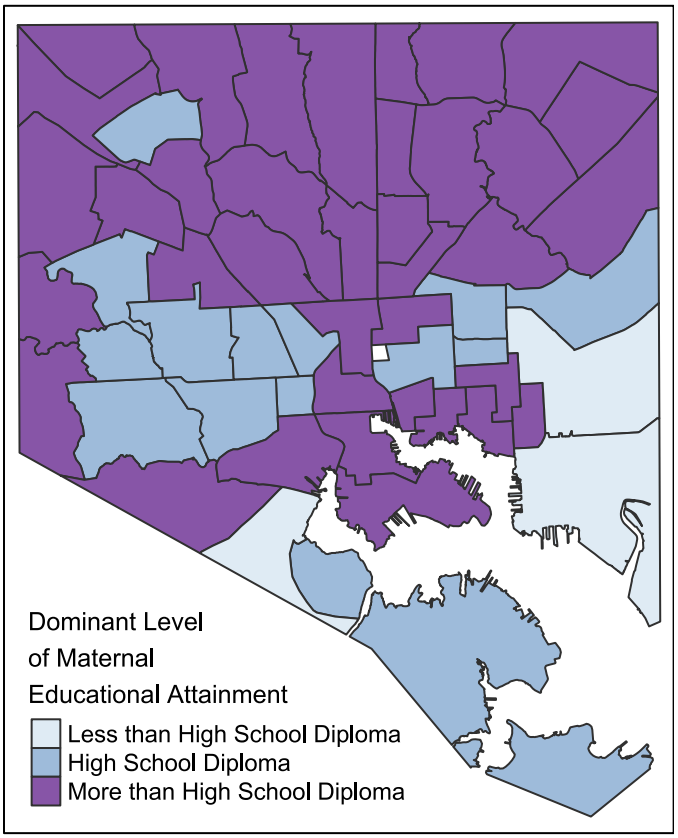


Source: Baltimore City Health Department

Figure 12 shows the *dominant* level of birthing parent's educational attainment for each CSA in 2018. To be clear, all CSAs may have all levels of education represented; shading shows only the *most common* educational attainment level in those who had a baby in that CSA in 2018. Areas with the most births to parents with *less than high school* are in Orangeville/East Highlandtown, Southeastern, and Westport/Mt. Winans/Lakeland. These three CSAs are part of areas that have experienced growth in the Latine/Hispanic population and immigrants from Latino countries (Filomeno, 2017). These trends may be due to Latine immigrants tending to have lower levels of education, relative to other racial/ethnic groups in the U.S. (U.S. Census, 2021).

Most CSAs in the eastern and western sides of the city have between 20% and 60% of births to birthing parents with a high school diploma/GED. The highest proportions for this group are in Pimlico/Arlington/Hilltop, Greater Rosemont, Sandtown-Winchester/Harlem Park, and Cherry Hill, all of which have more than 50% of children born to parents with a high school diploma or GED. Note that in the central portion of the city, the "White L" (Brown, 2016), the highest level of education dominates, as it does in the whole northern area of the city.

Figure 12. Dominant Level of Educational Attainment for Birthing Parents in each Baltimore City CSA, 2018



Source: Baltimore City Health Department

Birth and Race/Ethnicity

Race is a critical factor in birth, health, and life in Baltimore City. Centuries of race-based oppression and decades of discriminatory policies in housing, education, and health care have shaped a city in which Black residents have been far less likely than White residents to have access to good housing stock, safe neighborhoods, reliable health care, and high-quality schools. Like many U.S. cities, Baltimore had rampant redlining in the 20th century, which kept Black residents out of the high-value housing stock that became a foundation for Whites' intergenerational wealth (Pietila, 2010). Moreover, redlining and other racist policies pushed many Black residents into poorly resourced neighborhoods (or kept them out of high-resourced ones) (Massey & Denton, 1993), so they could not access the well-paying jobs, educational opportunities, transportation, and other resources that enable stability, security, and upward mobility. Thus, in Baltimore, access, quality, and outcomes related to education, health care, transportation, crime, and even lead exposure fall on racial lines. The "White L" and "Black Butterfly" (Brown, 2016), then, describe patterns of both social determinants of health (e.g., air pollution, access to high-paying jobs) and health outcomes themselves (e.g., heart disease, lifespan).

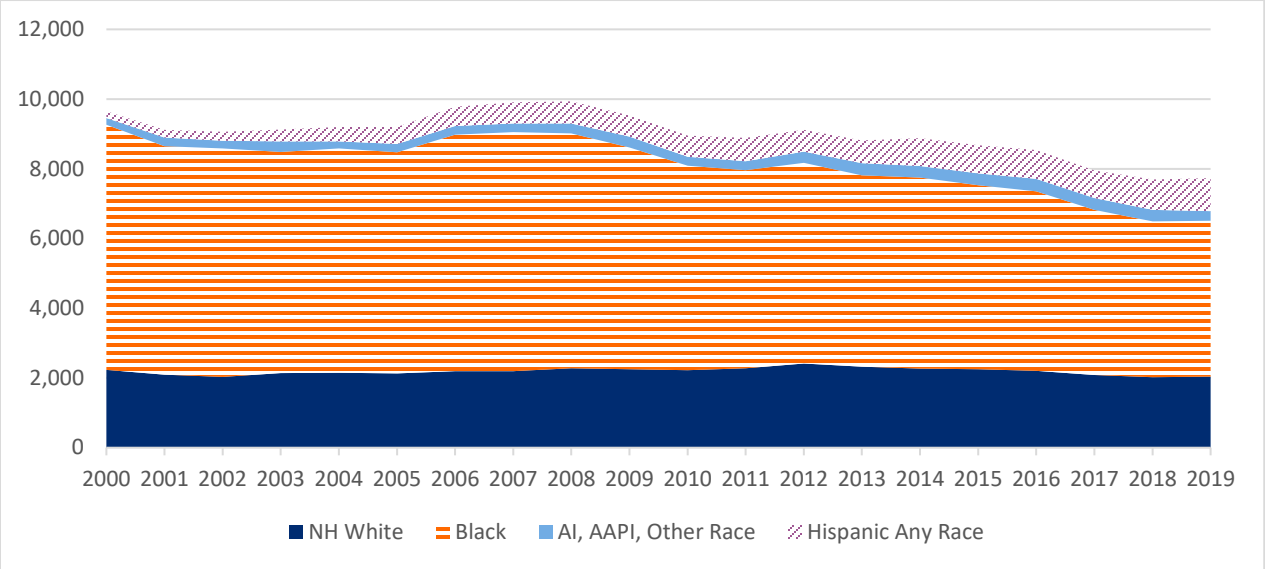
In recent years, Baltimore City's residents have been mostly Black (about 60% of the population) and White (about 30%), though the city has a growing Latine/Hispanic population (Abell Foundation, 2014; Filomeno, 2017) that constituted 7.8% of the population in 2020 (U.S. Census, 2020). Further, in 2013, the city began an initiative to attract immigrants to counter population loss (Abell Foundation, 2014). As a "destination city", Baltimore is home to immigrants from diverse locations (e.g., Caribbean, West Africa). The presence of several universities, most famously Johns Hopkins University and its world-class medical campus, attracts researchers and scholars from all over the world. Further, Baltimore is home to an Orthodox Jewish community, many of whom reside in the Northwest region of the city.

Figure 13 shows that the most significant trend between 2000 and 2019 is the decline in the absolute number of Black births, which has lowered the proportion of Black births and raised the proportion of White births. Separately, there has been an increase in the absolute number and proportion of Hispanic births. More specifically, the proportion of the Black racial group has decreased, from a high of 73% in 2000 to 59% in 2019. Meanwhile, the proportion of the White racial group has increased, from a low of 24% in the late 1990s to 37% in 2019 (except for 23% in 2007).

Vital statistics reports have not consistently separated racial groups by Hispanic status. In particular, American Indian and Asian-American/Pacific Islander groups were not distinguished by Hispanic status before 2015. However, these groups are quite small, absolutely and proportionately, and so setting them aside, there is a near-monotonic growth in the proportion of Hispanic children, which accounted for a low of 2% of births in 2000 and increased to a high of 12% of births in 2019. This finding dovetails with research identifying Baltimore as a "new destination" city for migrants (Filomeno, 2017; Hall & Stringfield, 2014)—although Baltimore is a destination for those from Caribbean, Asian, and African countries in addition to Hispanic ones in Central and South America (Abell Foundation, 2014). While the number of American Indian births have remained quite low, never reaching 1% of the total, the number

of Asian-American/Pacific Islander births has increased, from fewer than 100 per year in the mid-1990s to well over 200 per year since 2008. This constitutes a large within-group increase but is still a relatively small portion of the total.

Figure 13. Change in Baltimore City Births by Race/Ethnicity, 2000-2019



Source: Maryland State Department of Health

Note. NH is Non-Hispanic. AAPI is Asian-American/Pacific Islander. Other Race group comprises "unknown" or "other", and we derived it by subtracting identified racial groups from the total. Race and Ethnicity (i.e., Hispanic/non-Hispanic) are reported separately on birth certificates. Race/ethnicity counts protocols changed over time: Non-Hispanic White counts are available for all years, while non-Hispanic Black counts are available from 2010 and non-Hispanic Native American and AAPI counts are available from 2015. Before 2015, Hispanic category overlapped with racial group counts.

See the full data in Appendix Table 1.3.

The next three figures show changes in births by three racial/ethnic groups between 2008 and 2018 for each CSA in the city (see the full data in Appendix Table 1.4): Black, non-Hispanic; White, non-Hispanic; and Hispanic. Other, non-Hispanic births comprise American Indian, Asian-American/Pacific Islander, and those marked "unknown" or "other" on birth certificates. Note that relative to other groups, the group, Other, non-Hispanic births, which comprises American Indian, Asian-American/Pacific Islander, and those marked "unknown" or "other" on birth certificates, was small, making trends difficult to discern. Therefore, we did not include a map for other races. Baltimore City Health Department provided the data for these figures. Note that the figures have different scales because of wide ranges in baseline number of births.

Figure 14. Change in Number of Births, Black, non-Hispanic, 2009–2018

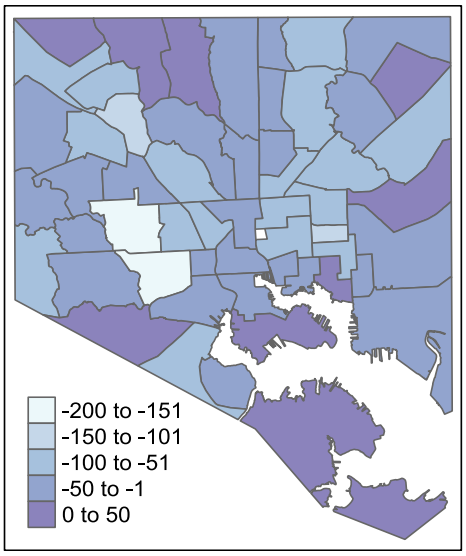


Figure 14 shows changes for children born to mothers who are **Black, non-Hispanic**. Most CSAs in the figure correspond to a decrease of 0 to 100 births. This panel aligns with an overall decrease in Black births in Baltimore City, as seen in Figure 13. The CSAs showing an increase in birth include Brooklyn/Curtis Bay/Hawkins Point, Morrell Park/Bioletville, South Baltimore, Canton, Claremount/Armistead, Hamilton, Cross-County/Cheswolde, Mt/Washington/Coldstpring, and Greater Roland Park/Poplar Hill.

Figure 15 shows changes in **White, non-Hispanic** births. As with Black births, many CSAs show a decrease. There are increases between 0 and 20, curling from the northwest corner and across a horizontal band in the middle of the city, running from Dickeyville/Franklintown to Orangeville/East Highlandtown. There has been relatively sharp growth in Cross-Country/Cheswolde and Glen-Fallstaff, CSAs in the far northwest of the city with a large Orthodox Jewish population, which tends to have higher birthrates (Boxer et al., 2020). The growth in births in these two areas outstrips the estimated growth in overall population between 2010 and 2019 which are about 3.8% for Cross-Country/Cheswolde and 3.5% for Glen-Fallstaff (Baltimore Neighborhood Indicators Alliance – Jacob France Institute**,** 2021)**.** Likewise, South Baltimore, which has a 40-60% increase in the overall number of births overall (Figure 7), experienced a relatively sharp increase in the number of White births. Note that the *proportion* of births that were White remained quite high, above 85% in both timepoints. Also, note that 2010 population data are from the 2010 U.S. Census while the 2019 data are five-year American Community Survey estimates, so the comparisons are imperfect.

Figure 15. Change in Number of Births, White, non-Hispanic, 2009–2018

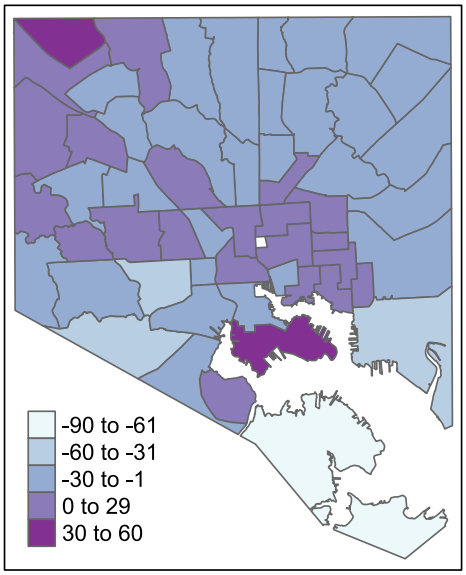


Figure 16. Change in Number of Births, Hispanic, 2009–2018

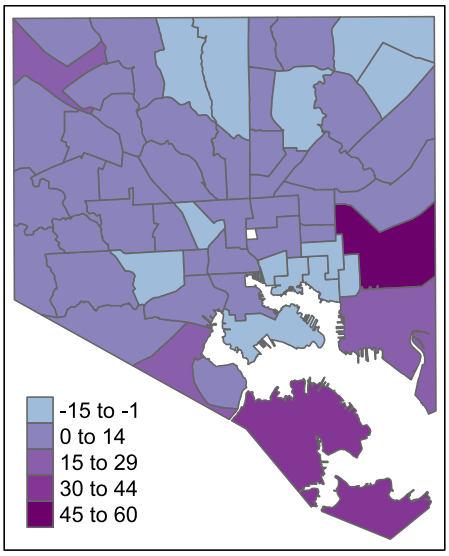


Figure 16 shows the changes for babies born to mothers who are Hispanic, any race. Note that most CSAs have slight growth, between 0 and 10. In the Orangeville/East Highlandtown neighborhoods to the east and the Westport/Mount Winans/Lakeland and Brooklyn/Curtis Bay/Hawkins Point neighborhoods to the south, there is dramatic growth, over 40%. This is consistent with shifting demographics in the general population (not just births), which shows large increases in the Hispanic population in Baltimore City, and further that these increases are concentrated in a few eastern and southern neighborhoods.

For CSA-level comparisons for 2008 and 2018, see Appendix Table 1.4. Also, Appendix Table 1.5 shows the number of births by age group and race/ethnicity from 2000 to 2020.

Births to Mothers Ages 15-19

Mother's age is an important factor in birth outcomes and child well-being. Compared to women ages 25 to 29, childbearing adolescents ages 15 to 19 and younger are at greater risk for eclampsia and fetal distress (Cavazos-Rehg et al., 2015). Beyond physical benefits are developmental ones, as adolescent parents are more likely to have mental and physical health problems (Hodgkinson et al., 2014; Patel & Sen, 2012), psychological distress (SmithBattle & Freed, 2016), negative socioeconomic effects (Lee, 2010), and, depending on relative socioeconomic status, attain less education (Gorry, 2019). Thus, relatively older mothers are likely to have more mental, emotional, and material resources to nurture young children.

In Baltimore City, there has been a stark reduction in teen births in the 21st Century, a continuation of nationwide and local trends (Kearney & Levine, 2014; Vozzella, 2004). Both the absolute number and proportion of teen births has reduced dramatically, as shown in Table 2 and Figure 17. These show a near-monotonic trendline, with the number of teen births dropping from 2,042 in 2000 to 531 in 2018. The proportion of teen births is commensurate, dropping from 21.2% in 2000 to 6.9% in 2018. Note that there are still significant disparities in adolescent birth rates among racial/ethnic groups, with a 2019 adolescent birth rate of 29.4 per 1,000 for non-Hispanic Black adolescents, 27.8 for non-Hispanic Whites, and 74.1 for Hispanics of any race.

This reduction coincides with changes to national policy as well as an extensive campaign from the Baltimore City Health Department. First, the Affordable Care Act, passed in 2012, allowed states to expand family planning services based on income, which the CDC has found to reduce births among adolescents ages 15–19 (2016). This national policy shift expanded the availability of family planning counseling and contraception in Baltimore City.

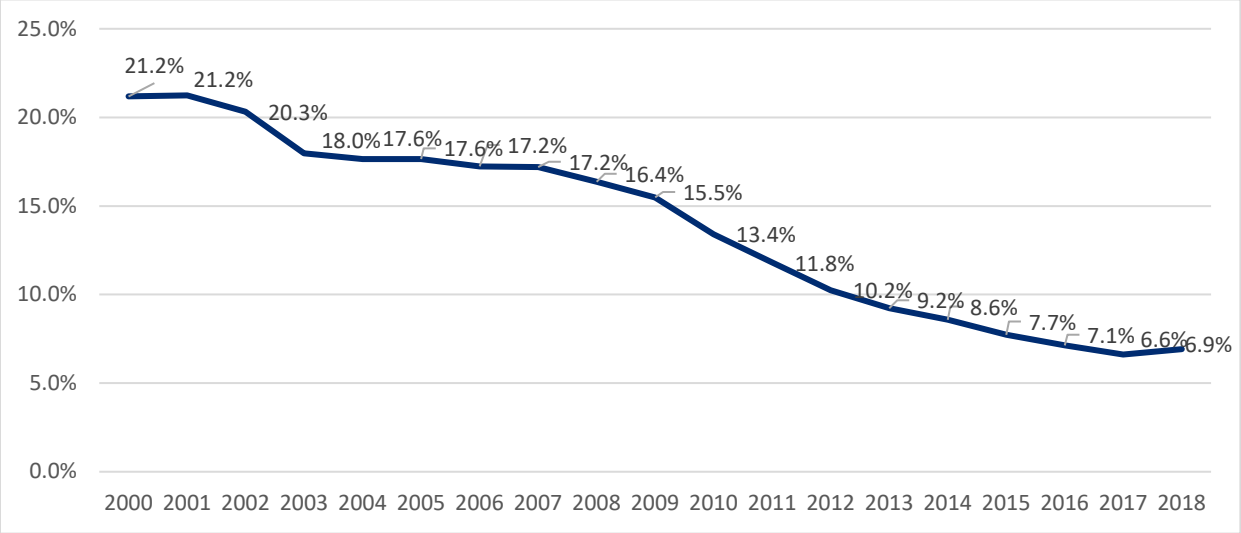
In addition, Baltimore City agencies including B'more for Health Babies, the Baltimore City Health Department, and the Family League of Baltimore collaborated on an initiative to reduce teen pregnancy in 2010 (Baltimore City Health Department, 2014). The partnership entailed a four-pronged strategy including a taskforce, improvement of clinical services, a youth advisory council, and a social marketing and educational campaign called ***Know What U Want U Choose*** that provided resources on planning for the future, including information on sexual health and healthy relationships (Baltimore City Health Department, 2014). Crucially, the campaign sought not to prescribe choices or stigmatize adolescent childbearing, which is pervasive and problematic (SmithBattle, 2013). Instead, it emphasized setting goals and making fully informed choices to reach them.

Table 2. Number and Proportion of Births to Mothers Ages 15-19, 2000-2018

Year	Total Births	Adolescents Ages 15–19	Births per 1,000 Females 15–19	Percent
2000	9,641	2,042	83.3	21.2%
2001	9,100	1,933	83.1	21.2%
2002	9,046	1,838	80.1	20.3%
2003	9,057	1,627	71.1	18.0%
2004	9,183	1,620	68.2	17.6%
2005	9,179	1,620	66.2	17.6%
2006	9,757	1,682	66.9	17.2%
2007	9,875	1,698	66.4	17.2%
2008	9,911	1,622	63.7	16.4%
2009	9,504	1,472	64.4	15.5%
2010	8,945	1,199	53.3	13.4%
2011	8,878	1,048	50.7	11.8%
2012	9,108	933	46.9	10.2%
2013	8,812	813	43.4	9.2%
2014	8,863	760	41	8.6%
2015	8,658	669	36.2	7.7%
2016	8,526	608	32.6	7.1%
2017	7,936	525	28.9	6.6%
2018	7,680	531	29.8	6.9%

Source: Baltimore City Health Department

Figure 17. Percent of Baltimore City Births to Adolescents Ages 15–19, 2000–2018



Source: Baltimore City Health Department

Figure 18. 2018 Births to Adolescents Ages 15-19 and Medical Service Locations

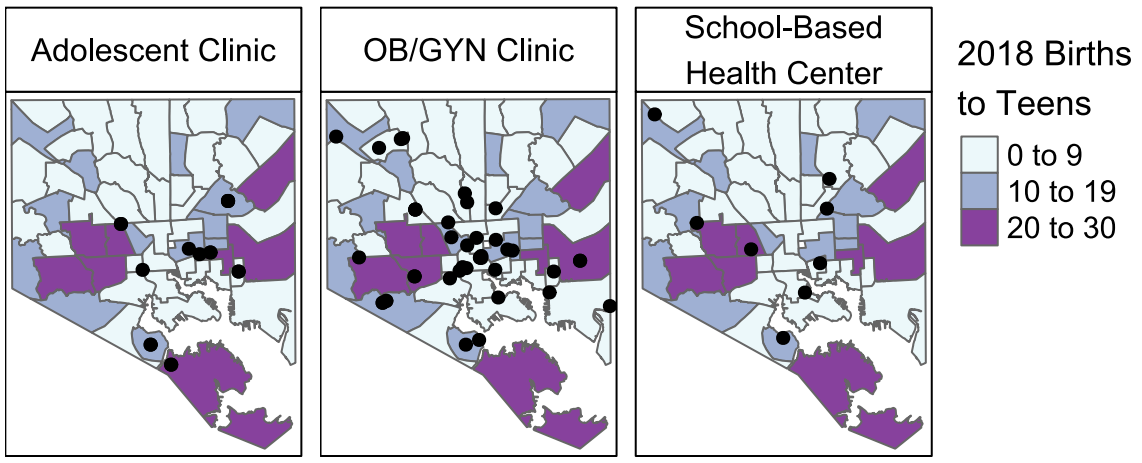


Figure 18 shows the location of adolescent clinics, OB-GYN clinics, and school-based health centers, all of which distribute contraception to youths, and the number of teenage births for each CSA in 2018. The highest concentration of services is in the center of the city, and that is where teenage births tend to be lower. However, this pattern is not consistent. There are also few services in the northern third of the city (which has a wealthier population). Moreover, Cherry Hill has several service locations and is in the middle tier, at 10 to 20 teen births. Thus, this map cannot prove a causal relationship between proximity to contraception services and teenage births, but it serves as a snapshot and guidance for future research. Decisions about future adolescent clinic sites and other services should consider myriad factors, including a given area's population and growth trends, socioeconomic status, safety, and transportation.

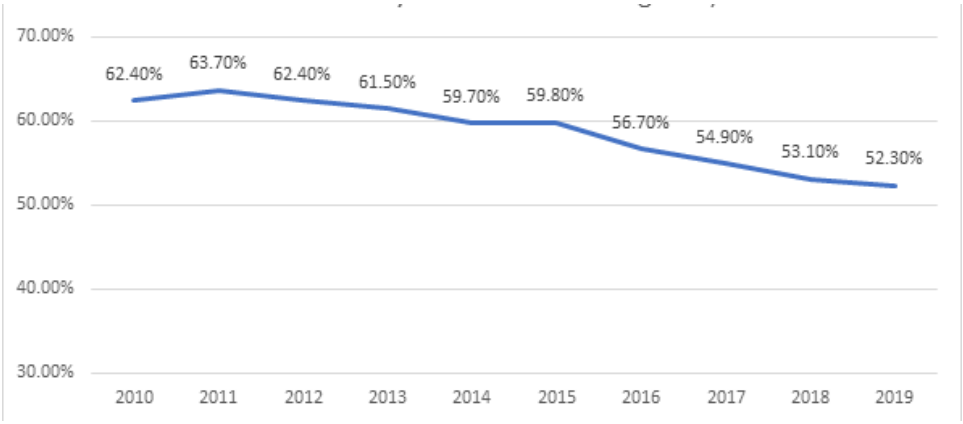
Health During Pregnancy and Birth for Birthing Parent and Babies

The health of children at birth depends on the health of the birth parent. Two of the most common birth health problems are prematurity and low birthweight, leading causes of which include maternal cardiovascular problems, including gestational and eclampsia type hypertension (high blood pressure) conditions.

Babies born premature, defined as before 37 weeks gestation for singleton births, are more likely to have various problems, including respiratory and digestive problems; hearing and vision problems; and in the middle- to long-term, growth, cognitive, behavioral, and social-emotional problems (Behrman & Butler, 2007). Prematurity is the top cause of low birthweight, which carries elevated risks for prenatal death (World Health Organization, 2014), neurodevelopmental problems (Blencowe et al., 2013), and long-term health risks such as diabetes and heart disease (World Health Organization, 2014).

Health care is critical to preventing low birthweight (World Health Organization, 2014). For example, a mother with pre-eclampsia (a pregnancy-related type of hypertension) getting early care can receive a diagnosis and proper treatment, both of which mitigate potential harm to her or her child. A mother not getting early care would be at greater risk for preterm birth and a low birthweight infant, because pre-eclampsia/eclampsia often entails compromised nutrition transfer to the fetus (World Health Organization, 2014). Participation in the Women Infant and Child (WIC) income-based supplemental nutrition program may help too, as it provides parents who are pregnant or have infants or young children with funding for nutritious food and is associated with reduced food insecurity and other health and housing benefits (Ettinger de Cuba et al., 2019). Figure 19 shows the proportion of pregnant parents who participated in WIC from 2010 to 2019, and Appendix Table 1.7 shows these data in table form. The figure describes a mostly downward trend. Although the absolute proportion of Baltimore households has decreased slightly in recent years (see Table 1), that could not explain the 17% decrease in pregnant parents participating in WIC. While these data cannot explain why this change occurs, it bears further study, especially with the increase in hypertension rates.

Figure 19. Proportion of Baltimore City Birth Parents Using WIC, 2010–2019



Source: Baltimore City Health Department

Figure 20 shows the proportion of Baltimore City pregnant people with hypertension, with a trendline showing an increase of about 4% to over 15%. Appendix 1.8 shows hypertension statistics in detail.

Figure 20. Proportion of Baltimore City Pregnant People with Hypertension (Chronic, Gestational, and/or Eclampsia), 2000-2019

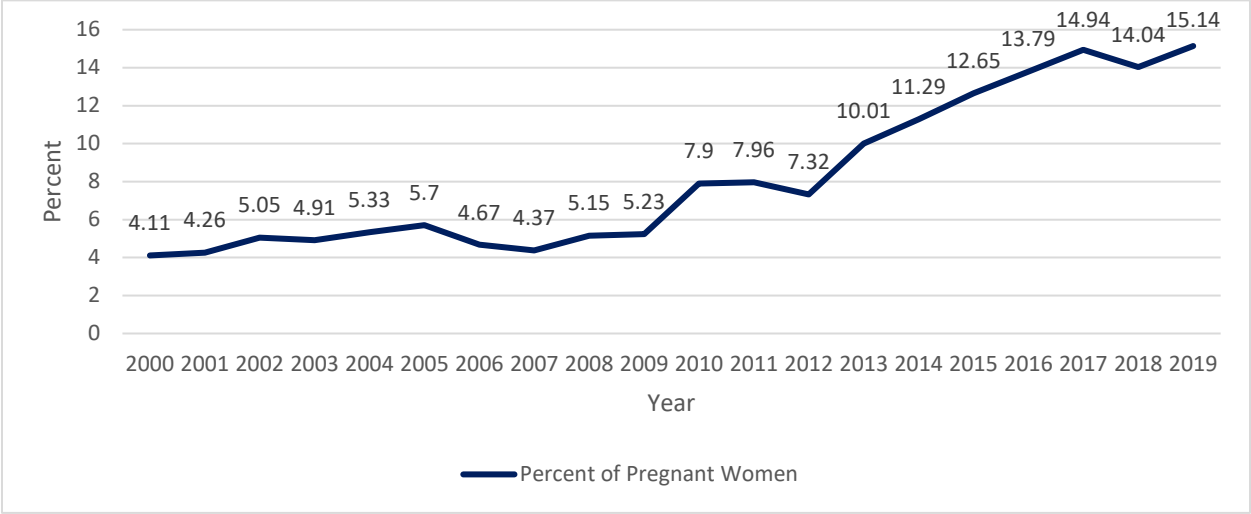


Table 4 shows the proportion of babies born full-term, at or above 5 pounds, and with mother receiving care in the first trimester. The table also shows national averages. For all factors, Baltimore lags behind national averages. Note that the lag is even greater for birthweight because the Baltimore data benchmark is 5 pounds while the national benchmark is 5.5 pounds (Martin et al., 2021). Beyond hypertension, risk factors for prematurity and low birthweight include heart disease, ages 18 and younger or 35 and older, smoking, obesity or being underweight, smoking, stress, and inadequate spacing between pregnancies (National Institute of Child and Human Development, 2017) as well as poverty (Jelliffe-Pawlowski et al., 2018). Appendix Table 1.6. shows a comparison of these figures across CSAs for the years 2010 and 2019.

Figure 21, Figure 22, and Figure 23 show the geographic distribution of proportion of babies born full-term, acceptable weight, and care from first trimester, respectively. Each figure shows an overlay of health prenatal care services and sites for the Women and Infant Children (WIC) program, which provides funding for food. Figure 21 shows that the highest proportion of full-term births is in the western and central portions of the city. Central is where OB-GYN clinics are concentrated. Figure 22 and Figure 23 shows that the "White L" (Brown, 2016) has the highest proportion of babies born at or above 5 pounds and with birth parents receiving prenatal care from the first trimester. These maps cannot show causal connections but provide an inroad to future research into the geographic (and equitable) distribution of resources that can support maternal and infant health. Appendix Table 1.6 shows CSA-level comparisons of health figures for 2010 and 2019. Appendices Figures 1.1, 1.2, and 1.3 show these maps in larger form and without health care locations.

Table 3. Percent Baltimore City Babies Born Full-term, at or above 5 pounds, and with Care from First Trimester, 2010-2019

Year	Full-term	≥ 5 pounds	Care from 1st Trim.
2010	86.48	88.33	57.02
2011	87.44	88.39	59.02
2012	86.63	88.22	62.66
2013	87.49	88.12	49.47
2014	87.31	88.51	48.47
2015	86.75	87.71	50.38
2016	86.41	88.36	50.93
2017	86.64	87.60	63.38
2018	87.64	88.10	64.49
2019	86.91	87.75	63.09
National 2019	**89.77**	**91.69 (≥ 5.5 lbs)**	**77.6**

Source: Baltimore City: Baltimore City Health Department; national: Martin et al. (2021).

Figure 21. Proportion of Baltimore City 2018 Births That Were Full-term by Community Statistical Area and Health Care Locations

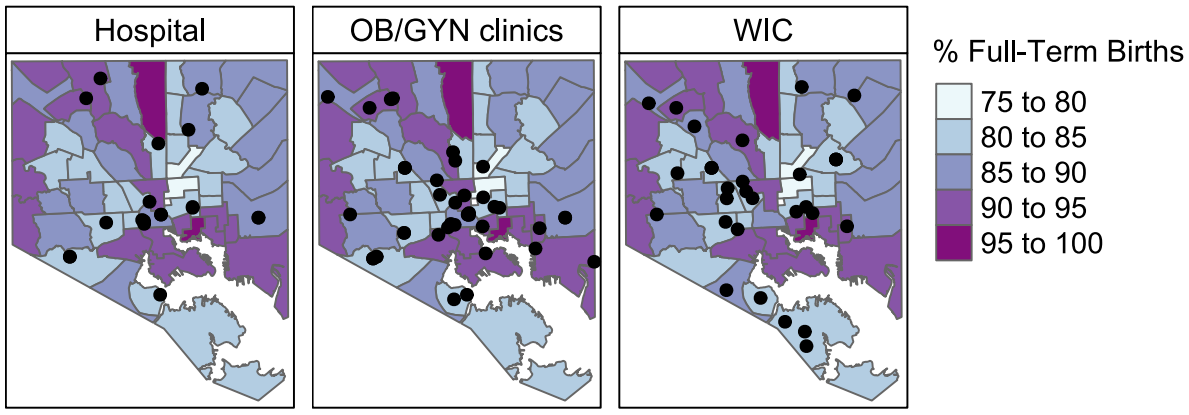


Figure 22. Where is There Early Care? Proportion of Babies of Acceptable Weight by Community Statistical Area for Baltimore City 2018 Births with Health Care Locations

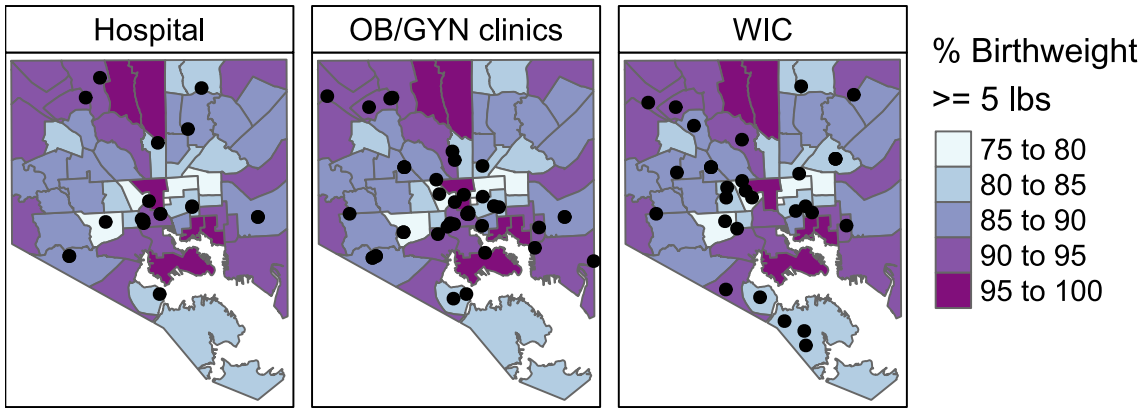
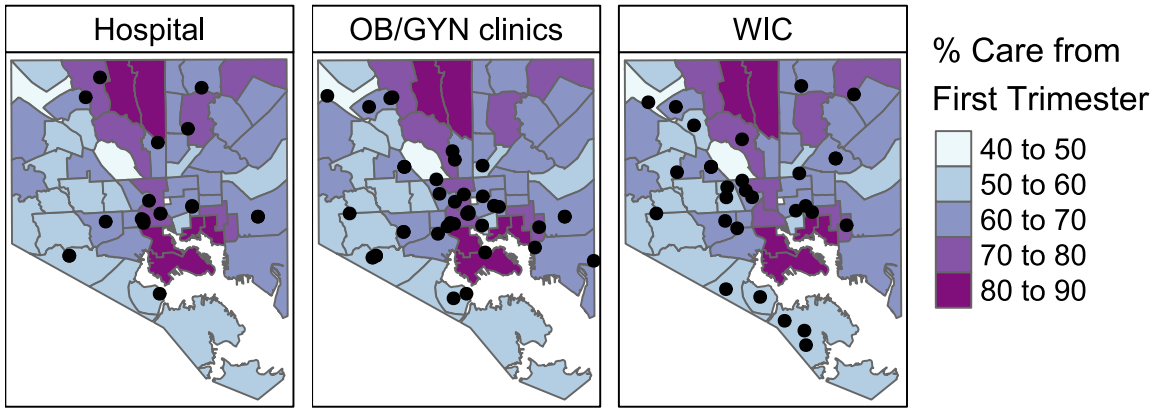


Figure 23. Where is There Early Care? Proportion of Women Receiving Care from First Trimester by Community Statistical Area for Baltimore City 2018 Births



CHAPTER 2

KINDERGARTEN EXPERIENCES IN BALTIMORE

Young children's experiences in kindergarten have critical implications for their health and well-being. Children's school readiness has been associated with their academic success and social and emotional functioning, which coincide with positive behavioral outcomes, fewer crimes, and higher rates of employment in later life (Duncan et al., 2007; Entwisle et al., 2005; Foster & Miller, 2007). However, achievement gaps between children from different socioeconomic backgrounds are evident as early as school entry and widen over time, contributing to long-term difficulties such as grade retention, dropping out, and unemployment (e.g., Welsh, Nix, Blair, Bierman, & Nelson, 2010). Kindergarten experiences are, therefore, crucial for young children, particularly for those from families and neighborhoods with few resources, who are more likely to face challenges as they transition to kindergarten (Janus & Duku, 2007).

In this chapter, we describe kindergarten experiences of children who were enrolled in Baltimore City Schools (City Schools) using multiple indicators of school readiness including attendance, Kindergarten Readiness Assessment (KRA), and kindergarten grade repetition. We analyze trends over time to understand how children's kindergarten experiences in Baltimore have been changing over the last few years.

Data Sources

For this study, we retrieved KRA data from the publicly available KRA reports published by the Maryland State Department of Education (MSDE). The Baltimore Education Research Consortium (BERC)[4] data archive that stores all historical administrative data from City Schools was used to examine attendance and kindergarten repetition.

Attendance in Kindergarten

Students' attendance in the early years is a grave concern for educators, as it is associated with long-term achievement (Gershenson, Jacknowitz, & Brannegan, 2017; Ready, 2010) and later chronic absenteeism (Ansari & Purtell, 2018; Dubay & Holla, 2016). In addition, chronic absenteeism has been found to be more common among disadvantaged children (Ehrlich, Gwynne, & Allensworth, 2018), who gain the most when they get the full early education experience. Thus, establishing the habit of attendance during the early childhood period becomes important, and many early childhood programs and services attempt to support families learning the importance of attendance.

[4] https://baltimore-berc.org/

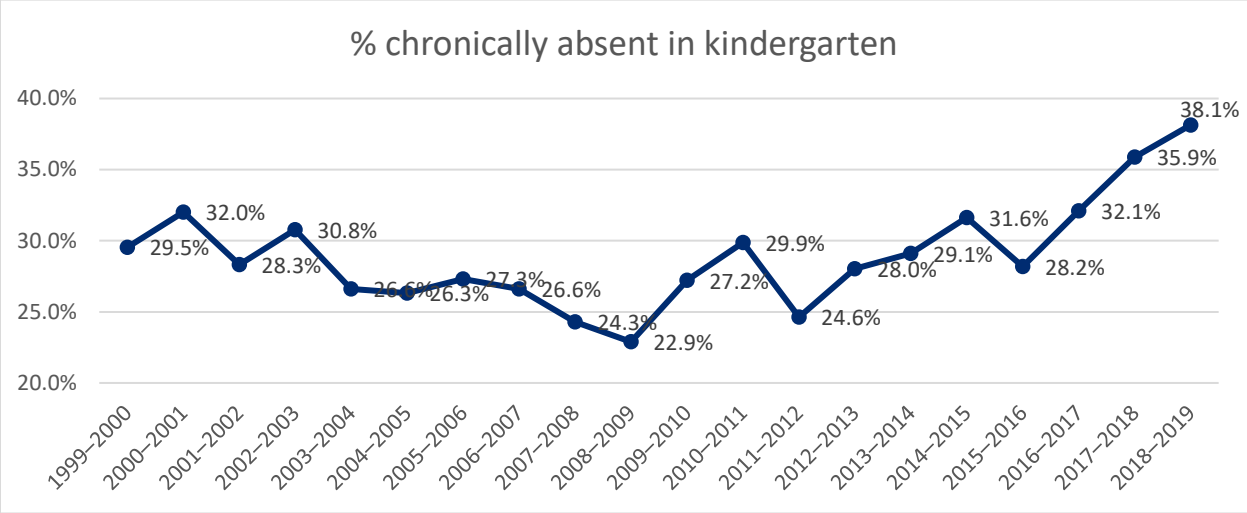
Chronic absenteeism is a significant issue that, if left unaddressed, has a long-term impact on children's success in their future academic years. Research indicates that early absences correlate with reading difficulties and poor attendance patterns in the later years and that the effects of poor attendance among low-income children, who are less likely to have access to resources outside of school to help them catch up, are even more pronounced. Baltimore City Head Start is committed to addressing chronic absenteeism because we see it as one of the most important and fundamental ways to help close the achievement gap and to prepare our youngest learners for success in the future.

- *By Shannon Burroughs-Campbell, Executive Director of Baltimore City Head Start, April, 2020*

To understand kindergarten attendance patterns in Baltimore City, we analyzed kindergarten chronic absenteeism prevalence for City Schools kindergarteners from 1999 to 2019. Figure 24 shows the percentage of children in kindergarten years who were chronically absent for the last 20 years. Appendix Table 2.1 shows the number of students enrolled in each academic year and the number of students who were chronically absent. Note that this analysis uses the MSDE Report card definition of chronic absenteeism as of 9/1/2020[5].

[5] **What is chronic absenteeism?** A student was counted as chronically absent if (a) they were enrolled in Baltimore City Schools for 10 or more days in the school year, and (b) they were absent for 10% or more of the school days enrolled. This definition was applied to all years of data. see Chronic absenteeism at https://reportcard.msde.maryland.gov/Definitions/Index

Figure 24. Kindergarten attendance since SY1999-2009



The data show that kindergarten chronic absenteeism rates have changed over time. On average, about 29% of kindergarteners were chronically absent over the past 20 years. In recent years, higher rates of chronic absenteeism have occurred, with over 30% since SY2016–2017. In the most recent year represented, SY2018–2019, 38.1% of kindergarteners in Baltimore City Schools were chronically absent. These data underscore the need for further exploration of early chronic absenteeism, as early attendance is strongly associated with children's long-term success (Ansari & Purtell, 2018; Dubay & Holla, 2016).

Previous studies have found that Black children are almost twice as likely as White, Latine, and Asian children to be chronically absent in early childhood education settings, and they experience more logistical barriers in getting to school than their White or Latine peers (Ehrlich et al., 2014). Black and Latine children have almost twice as many absences due to sickness than White students (Ehrlich et al., 2014). It is still not clear why we observe high percentages of chronic absenteeism in Baltimore City, however, it is important to keep track of attendance patterns and reasons to ensure that this important indicator of students' success is not overlooked.

Kindergarten Readiness Assessment

This section describes the trends of the Kindergarten Readiness Assessment (KRA) results from SY2014-2015 to SY2019-2020.

History of KRA in Maryland

KRA scoring guidelines have been changed over time in efforts to improve the assessment system in Maryland (see Table 6). The KRA was developed over four years through a state partnership between Maryland and Ohio as part of the "Race to the Top" Early Learning Challenge Grants awarded in 2011. In the fall of 2014, KRA 1.0 was first implemented in Maryland. The state supported the KRA's

administration and gathered feedback from teachers to make improvements. It was found that the assessment and the reporting requirements of KRA 1.0 were time intensive.

Table 4. Summary of KRA History

Version	Year(s) of Administration	Summary of History
KRA 1.0[6]	2014	First administration
KRA 1.5[7]	2015 -2017	Reduced version of KRA 1.0
KRA 2.0[8]	2018 and thereafter	Revised version of KRA 1.0 and 1.5

Note. This table is reproduced using the data reported by *Ready for Kindergarten: Kindergarten Readiness Assessment Technical Report-Fall 2014* and *The 2018-2019 Kindergarten Readiness Assessment Technical Report*

Addressing the challenges, the state implemented a reduced version of the KRA, referred to as KRA 1.5., in fall 2015, 2016, and 2017. KRA 1.5 reduced the number of domains from six (Language and Literacy, Mathematics, Physical Well-being & Motor Development, Social Foundations, Science, and Social Studies) to four (Language and Literacy, Mathematics, Physical Well-being & Motor Development, and Social Foundations) and the number of items from 63 to 50. Among the 13 items removed from the KRA 1.0, five were performance-task or selected-response items and eight were observational-rubric items. The reasons to reduce KRA items were based on the findings indicating that these 13 items were not important indicators for students' kindergarten readiness or difficult to administer (WestEd, 2014; 2015).

In 2018, KRA 2.0 (4 domains) was implemented in Maryland, which improved the score rules for different scoring scenarios, including "Complete", "Complete with NS (Not Scorable)", "Some items were not complete", and "All items were not complete". For instance, students to whom all 50 items were administered, were to be identified as "Complete" for their completion status.

Meanwhile, English language learners or students with disabilities who were unable to complete an item received a score of "NS" for that item and their completion status was identified as "Complete with Not Scorable." Additionally, the KRA 2.0 included *Guidelines on Allowable Supports for the Kindergarten Readiness Assessment and related Quick Guides for Children with Disabilities and English Learners*. Appropriate Level for the Field supports were provided for English Language Learners and children with disabilities. In addition, parents of English learners and children with disabilities received an Individual Student Report to view their children's performances on the KRA.

[6] *Ready for Kindergarten: Kindergarten Readiness Assessment Technical Report-Fall 2014* https://education.ohio.gov/getattachment/Topics/Early-Learning/Kindergarten/Ohios-Kindergarten-Readiness-Assessment/Kindergarten-Readiness-Assessment-for-Data-Manager/KRA_Technical_Report_2014_Final.pdf.aspx

[7] *Ready for Kindergarten: Kindergarten Readiness Assessment Technical Report-Fall 2015*. https://ed.sc.gov/tests/tests-files/pre-k-and-kindergarten-readiness-assessments/kra-technical-report-2015/

[8] https://pd.kready.org/data/ck/sites/116/files/MD%20KRA%2020%20Scoring.pdf

Note that in this report, we are only using data retrieved before the COVID-19 pandemic, up to SY2019-2020 (KRA implemented in Fall 2019). The KRA was not implemented in 2020 because of the COVID-19 pandemic. Although the KRA was implemented in 2021, there is *no* sufficient evidence that the data are comparable to the data from previous years. Further research is needed to understand gaps and opportunities in children's school readiness by looking at the post-COVID KRA data.

Table 7 describes the percentage of kindergartners in Baltimore demonstrating readiness from SY2014-2015, compared to the data from the state of Maryland. Over the six years, less than half of Baltimore kindergarteners demonstrated readiness. In addition, children in Baltimore showed about 1 – 10% gap in school readiness compared to that of the state of Maryland. In the most recent school year before the COVID-19 pandemic, only 37% of children demonstrated readiness in Baltimore.

Table 5. Percentage of kindergartners Demonstrating Readiness in SY2015-2019

School Year	KRA Version	% of Children Demonstrating Readiness in Baltimore	% of Children Demonstrating Readiness in Maryland
2014-2015[9]	KRA 1.0	48%	47%
2015-2016[10]	KRA 1.5	42%	45%
2016-2017[11]	KRA 1.5	38%	43%
2017-2018[12]	KRA 1.5	41%	45%
2018-2019[13]	KRA 2.0	39%	47%
2019-2020[14]	KRA 2.0	37%	47%

Source: MSDE Kindergarten Readiness Assessment Report (https://www.readyatfive.org/download-document/getting-ready.html)

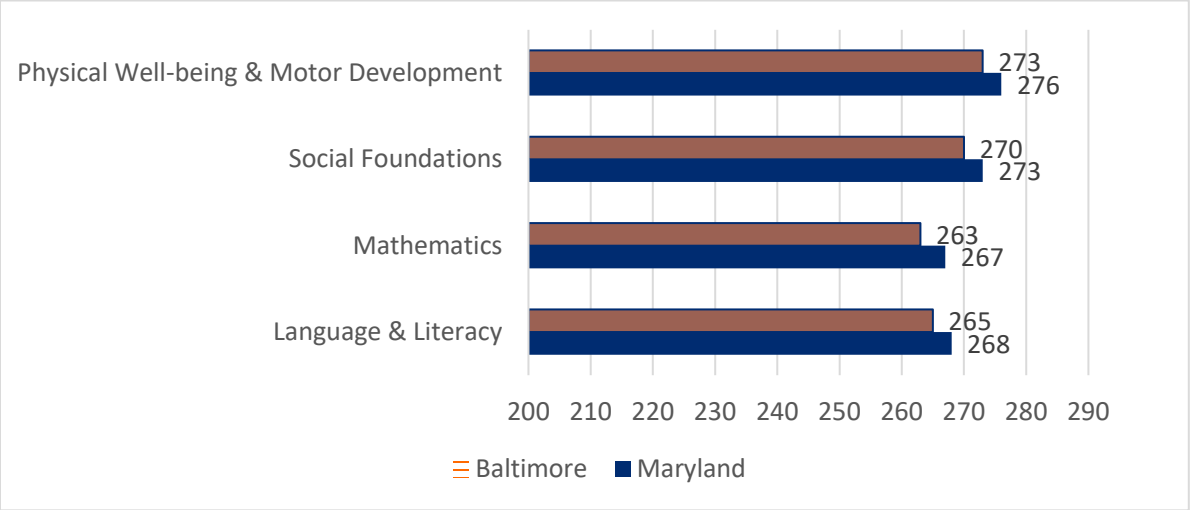
Note that the percentages shown in Table 7 are to explore the trend over time but the percentages are not comparable across years because KRA scoring guidelines change over time (see Table 6). In addition, Baltimore City and Maryland data should be examined with some caution. **Some jurisdictions in Maryland implement KRA by the sampling method, while Baltimore City implements by the census method.**

Analyzing by domain, Figure 25 shows that Baltimore City kindergartners show the highest score on the Physical Well-being and Motor Development domain, followed by the Social Foundations, Language and Literacy, and Mathematics domains. Although the gap between Baltimore City and Maryland was not

[9] Maryland State Department of Education (2015). *Readiness Matters: The 2014-2015 Kindergarten Readiness Assessment Report*. https://files.eric.ed.gov/fulltext/ED589994.pdf
[10] Maryland State Department of Education (2016). *Readiness Matters: The 2015-2016 Kindergarten Readiness Assessment Report.* https://files.eric.ed.gov/fulltext/ED572305.pdf
[11] Maryland State Department of Education (2017). *Readiness Matters: The 2016-2017 Kindergarten Readiness Assessment Report.* https://files.eric.ed.gov/fulltext/ED589984.pdf
[12] Maryland State Department of Education (2018). *Readiness Matters: The 2017-2018 Kindergarten Readiness Assessment Report.* https://files.eric.ed.gov/fulltext/ED589988.pdf
[13] Maryland State Department of Education (2019). *Readiness Matters: The 2018-2019 Kindergarten Readiness Assessment Report.* https://files.eric.ed.gov/fulltext/ED594322.pdf
[14] Maryland State Department of Education (2020). *Readiness Matters: The 2019-2020 Kindergarten Readiness Assessment Report.* https://files.eric.ed.gov/fulltext/ED612005.pdf

large, the biggest gap was found in the mathematics domain. Appendix Figure 2.2 shows the readiness data, by domain, measured from fall 2014 to fall 2019. The biggest gap is within the Mathematics domain, followed by the Language and Literacy, Social Foundations, and Physical Well-being and Motor Development domains.

Figure 25. Baltimore City and Maryland Kindergarteners Demonstrating Readiness by Domain, SY2019-2020

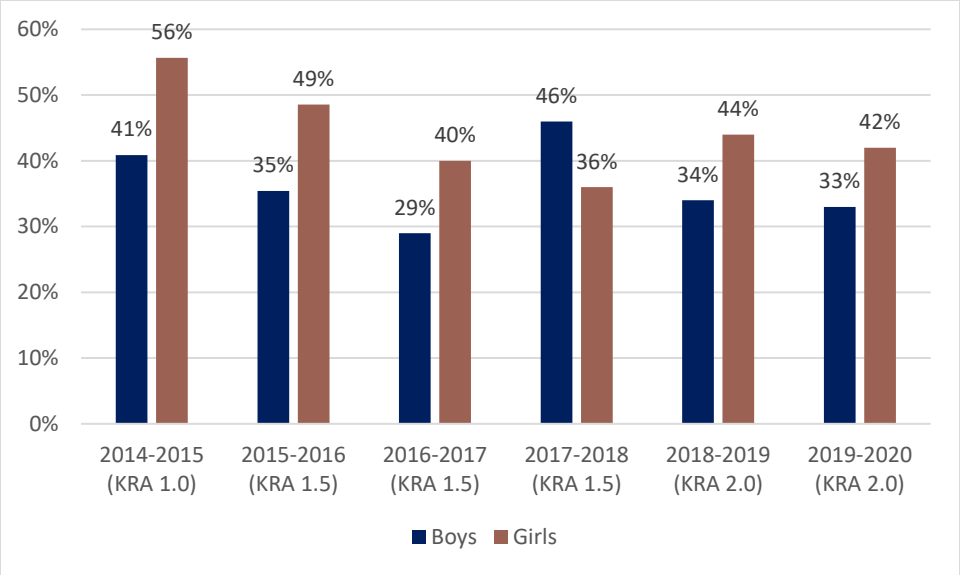


Source: MSDE Kindergarten Readiness Assessment Report (https://files.eric.ed.gov/fulltext/ED612005.pdf)

We examined children's KRA scores vary by their demographics, such as gender, race/ethnicity, whether they received any services for identifying as an English Language Learner (ELL), and whether they have an Individualized Education Program (IEP).

As shown in Figure 26, girls consistently score higher than boys. This is consistent with previous research, demonstrating that girls perform better in kindergarten than boys (Eriksson et al., 2012; Galsworthy et al., 2000; Marjanovič-Umek & Fekonja-Peklaj, 2017).

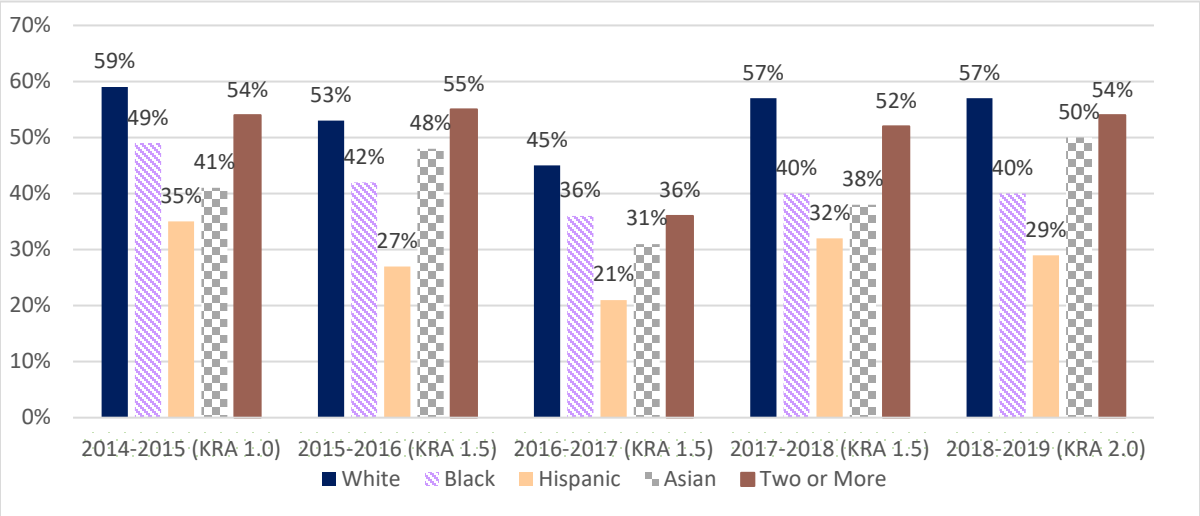
Figure 26. Percentages of Kindergartners Demonstrating Readiness by Gender since SY2014-2015



Source: MSDE Kindergarten Readiness Assessment Report; 2016-2017 and 2019-2020 data are from BERC and were not on the publicly available report.

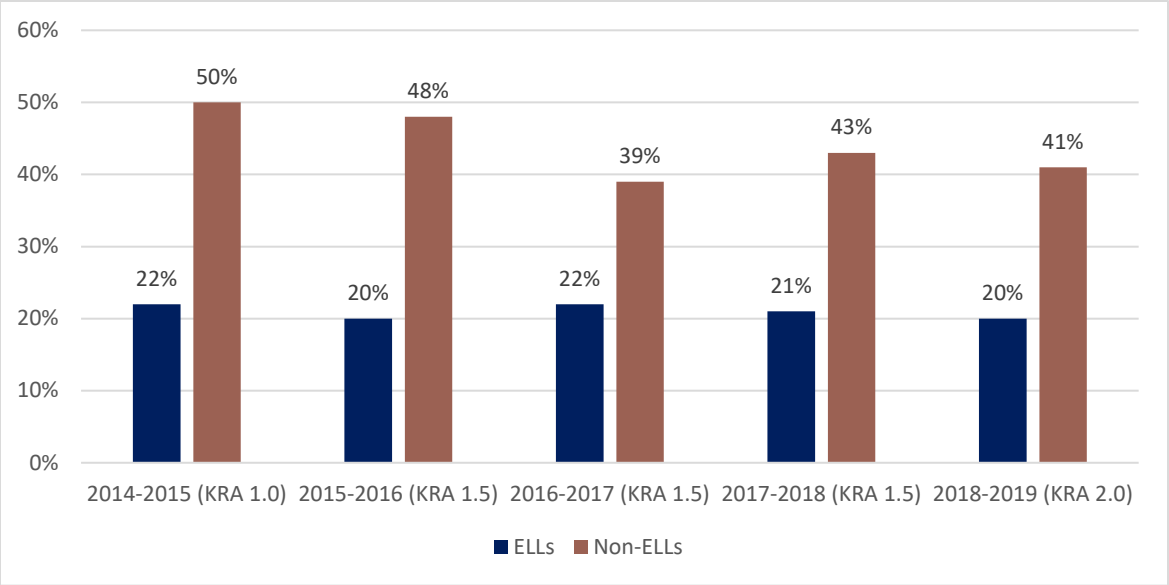
Figure 27 demonstrates that there are persistent gaps in KRA between Black, White, and Hispanic children. Hispanic children are less likely to demonstrate school readiness compared to the children in all other groups. Within-group performance was quite consistent over time. Because the KRA is only available in English, it is possible that Hispanic children's performance is confounded with their language capacity as ELLs. We observe a significant gap between ELLs and non-ELLs in school readiness (Figure 27). Consistently, ELLs are less likely to demonstrate readiness compared to those who are English proficient.

Figure 27. Percentages of Kindergartners Demonstrating Readiness by Race/Ethnicity since SY2014-2015



Source: MSDE Kindergarten Readiness Assessment Report; 2016-2017 data are from BERC and were not on the publicly available report.

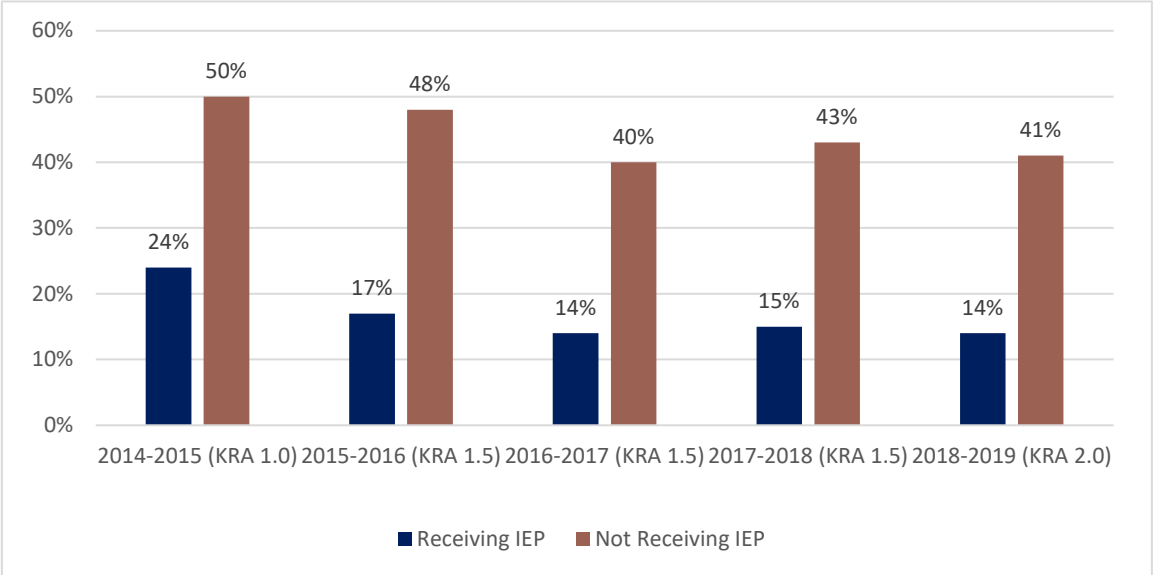
Figure 28. Percentages of Kindergartners Demonstrating Readiness by EL since SY2014-2015,



Source: MSDE Kindergarten Readiness Assessment Reports.

Lastly, Figure 29 shows the comparison between students who have IEP and those who do not have IEP. Students without IEP generally score much higher than those with IEP. The gap between students having IEP and not having IEP in demonstrating readiness is about 30% consistently from 2015 to 2018. From the data we have analyzed, it is important to note the value of improving the early detection of disabilities to offer resources to children and their families.

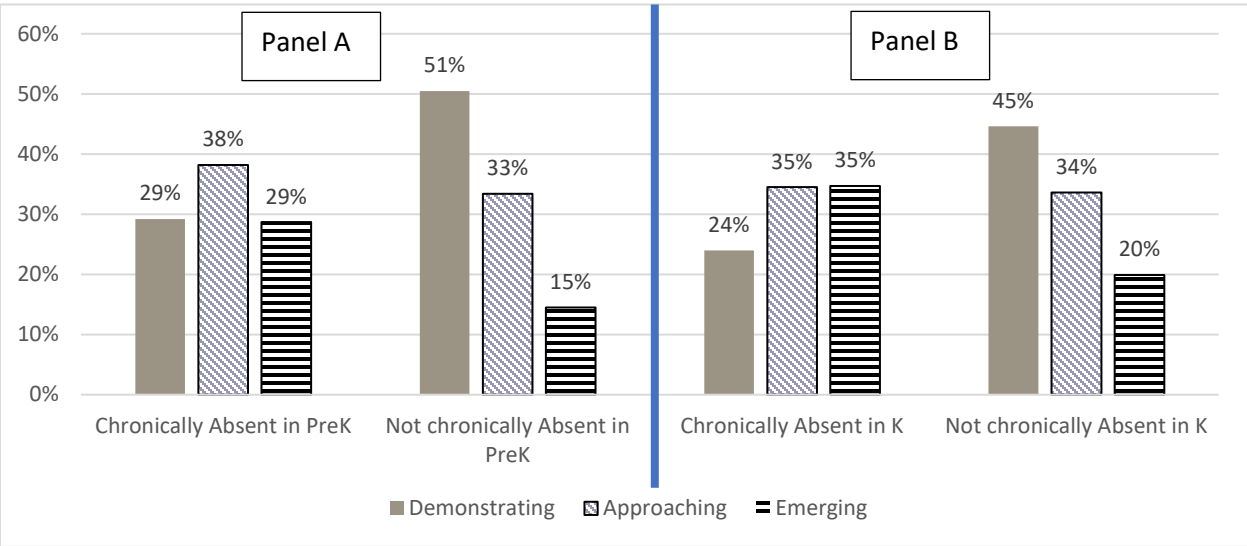
Figure 29. Percentages of Kindergartners Demonstrating Readiness by IEP since SY 2014-2015



Source: MSDE Kindergarten Readiness Assessment Reports.

We also investigated the relationship between children's attendance and KRA. First, Panel A of Figure 30 shows the data from children who attended public PreK in City Schools. When children were not chronically absent during PreK, they were more likely to demonstrate readiness (47%) compared to those who were chronically absent (30%). Furthermore, Panel B shows that children who demonstrated readiness in fall 2018 overall were more likely to have good attendance in kindergarten.

Figure 30. Percentages of Kindergartners Demonstrating Readiness by Attendance in PreK and K, 2018-2019



Source: BERC data archive.

Note. By MSDE definition, A student was counted as chronically absent if (a) they were enrolled in Baltimore City Schools for 10 or more days in the school year, and (b) they were absent for 10% or more of the school days enrolled.

Kindergarten Repetition

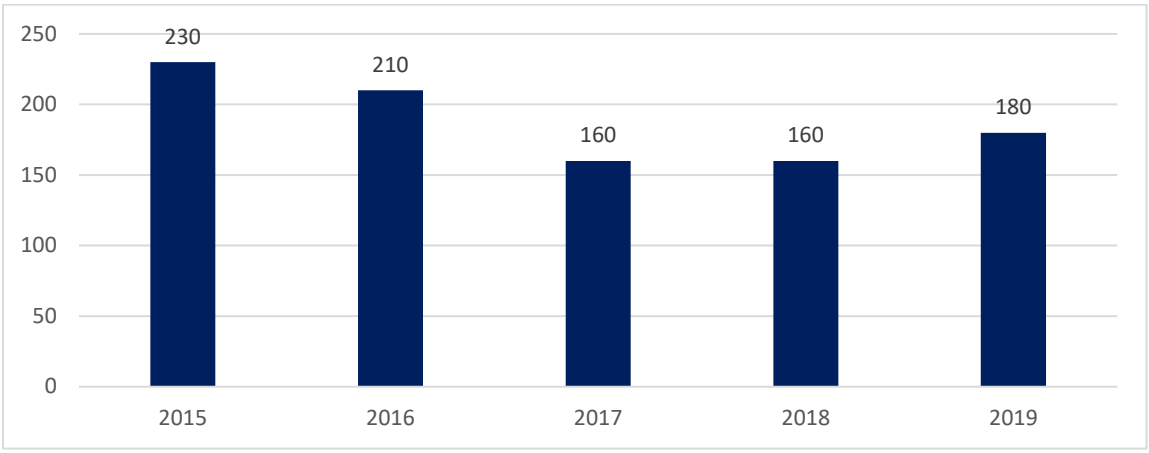
Children are reported to not be ready for kindergarten primarily when teachers report concerns about their ability to cope with the demands of schooling or being deemed unprepared academically, socially, or developmentally for first grade (Greenburg, 2021). Typically, the expectation is that with additional time in school, students will receive more of the instruction and support they need to be adequately prepared for and able to adjust to the first grade. Children who are retained tend to be younger, have fewer skills at school entry, and are more likely to be identified as having a disability (Greenburg, 2021). Furthermore, children from disadvantaged family backgrounds who do not receive center-based early care and education are more likely to be retained in kindergarten (Greenburg, 2021).

The evidence is, however, mixed on whether kindergarten repetition is the most effective way to deal with children who have not met social and academic milestones by the end of the year. While there are some immediate positive effects of kindergarten repetition, such as school readiness, research shows that they diminish by the third grade (Dong, 2010; Greenburg, 2021). Also, children who are retained in kindergarten may learn less in mathematics and reading than they would have had they been promoted

to the next grade (Hong & Raudenbush, 2005). In the long-term, the benefits to achievement are minimal (Greenburg, 2021).

Figure 31 shows the general trends of kindergarten repetition in City Schools from 2015 to 2019. About 150 to 200 repeated each year. Although they are not a significant portion of the kindergartners, it is still urgent to both understand how to best prepare children for kindergarten entry and to develop alternative strategies for addressing students who are determined not to be making adequate progress.

Figure 31. Kindergarten repetition since SY2014-2015



Note. Rounded to the nearest 10 to protect student privacy

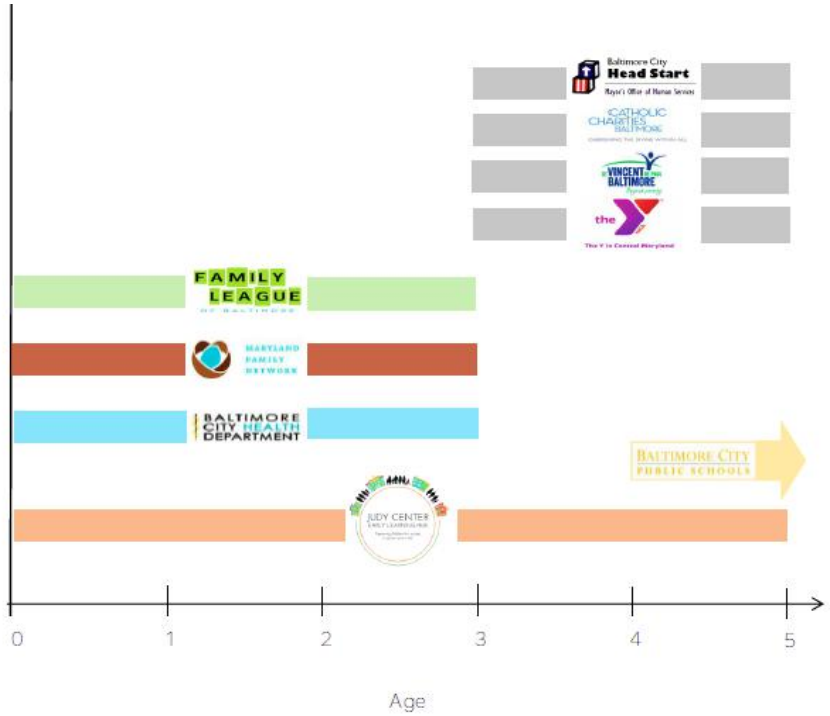
CHAPTER 3

BIRTH TO KINDERGARTEN: CHILDREN'S ACCESS TO PUBLIC EARLY CHILDHOOD SERVICES

Many urban cities, including Baltimore City, put a significant amount of financial and human resources into early childhood services and policies to improve children's developmental trajectories. However, because of a lack of comprehensive longitudinal datasets, we do not know the status of early childhood services coordination, quality of collaboration, or barriers to access of these programs, and their associations with child outcomes.

To address this gap, in 2012, BERC established Baltimore City's Early Childhood Data Collaborative (ECDC), which houses multiple publicly funded entities' longitudinal administrative data. The ECDC data partners include the Baltimore City Health Department, Maryland Family Network (Early Head Start), Head Start, and Baltimore City Public School System (City Schools). The ECDC's goal is to follow birth cohorts of children over time by cross-linking partners' data, and thereby understand the experiences of young children in Baltimore and how those experiences relate to children's later health and education outcomes. Thus, the ECDC helps its partners more effectively monitor and adjust early childhood strategies. Figure 32 describes the partner agencies in ECDC and the age of children who receive services from the agencies.

Figure 32. Early Childhood Data Collaborative



Using the data from ECDC, this chapter describes young children's access to publicly funded early childhood services from birth to age 5. Furthermore, we examine how children's pathways in publicly funded early childhood services from birth to age 5 are related to their later experiences in school, measured by long-term attendance, KRA scores, and long-term grade repetition. We answer the following questions:

1) To what extent did young children have access to publicly funded early childhood services?
2) What are the characteristics of children and families who accessed publicly funded early childhood services?
3) What are the most common pathways from birth to kindergarten that children go through using publicly funded early childhood services?
4) To what extent are the pathways associated with children's long-term outcomes up to 5th grade?

To investigate the long-term effects of early childhood services on children's developmental trajectories, this report used the cohort of **SY2013-2014** kindergartners. We also validated the findings by repeating the analyses using the **SY2014-2015** kindergarten cohort. The publicly funded early childhood services examined in this report include:

Maternal & Infant Care Program (M&I)[15]: The M&I Program is offered by the Baltimore City Health Department. The program aids expectant mothers, offering various services, including appointments for pediatric and prenatal care, screening and treatment for sexually transmitted diseases and infections, as well as family planning, education, and counseling services. To be enrolled in these services, mothers are directly referred to this program by doctors or other providers (social services or community services). Referrals can be also made via Health Care Access of Maryland.

Baltimore Infants and Toddlers Program (BITP)[16]: The BITP is a program across city agencies to support families with children birth through age 2 who are experiencing developmental delays (e.g., physical, cognitive, psycho-social development) or with medical conditions that require assistance. Services, which are provided at no cost to families, include speech pathology, occupational therapy, early intervention services, psychological services, and family counseling.

Early Head Start (EHS)[17]: The EHS programs in ECDC are operated by Maryland Family Network. EHS strives to provide support for school readiness and family self-sufficiency, with special emphasis on family engagement and services for pregnant women. For families with income at or below federal poverty level, services are comprehensive for parents and children who need assistance with pregnancy and care until the child is 3 years old. Programs working alongside Early Head Start include workforce development, health services, continuing education for parents, employability services, food services and assistance, mental health counseling, and community partners.

[15] https://health.baltimorecity.gov/node/168
[16] https://health.baltimorecity.gov/maternal-and-child-health/baltimore-infants-and-toddlers-program
[17] https://www.marylandfamilynetwork.org/first-five-years/early-head-start
Note that the EHS data used in this report were obtained before the EHS service expansion was implemented in the city. The number of enrollments is low in this report because of the limited seats were available for the SY2013-2014 kindergarten cohort. Future studies are needed to understand the effects of expanded seats in EHS.

Head Start (HS)[18]: HS, a federal program, provides services for education and family development for low-income children and families. Through HS participation, families can receive support services, including referral for public assistance, parenting workshops, and comprehensive services (e.g., health, nutrition, mental health). The HS curriculum is focused on school readiness (i.e., literacy, mathematics, science, social studies), social-emotional development, music, and movement.

Public Pre-Kindergarten (PreK)[19]: PreK in City Schools enroll children starting at age 4, with 20 slots per program available to families. Priority for enrollment is given to children who need special education services, are experiencing housing instability, or are considered low-income. In these settings, children learn primarily through play and skills related to early literacy and numeracy. Students also learn about health habits and foster positive social skills.

Data Sources

The data used in this study is from the ECDC data archive housed within BERC. We used the SY2013-2014 kindergarten cohort (*n* = 7,790) to conduct the analyses. We restricted our sample to "first time" kindergarteners who were not repeating kindergarten because children who repeat kindergarten might have had different trajectories from children who did not repeat. We only included children who were born between September 2, 2007, and September 1, 2008. The final sample size was 7,447. A total of 5,599 children (75%) among this cohort was born in Baltimore (i.e., appeared in the Baltimore City vital statistics). The cohort was in 5th grade in SY2018-2019 before the COVID-19 pandemic. We used the data up to 5th grade to analyze their long-term outcomes. We note that the KRA was not available for this cohort because the KRA was first implemented in 2014 (see Chapter 2).

To validate the findings from the SY2013-2014 cohort, we also used the data from the SY2014-2015 kindergarten cohort (*n* = 7,752). After excluding children who were repeating kindergarten or who were not born between September 2, 2008, and September 1, 2009, the final sample consisted of 7,357 kindergartners. A total of 5,415 children (74%) among this cohort was born in Baltimore. Up to 4th grade data in SY2018-2019 were used for this analysis. The KRA data were available for this cohort. Thus, the KRA analyses were conducted only using this cohort data.

[18] https://www.bmorechildren.com/head-start
As of 2021, Head Start programs in Baltimore City are operated by four Head Start Grantees: The Mayor & City Council Baltimore City Head Start, Catholic Charities, St. Vincent De Paul, and The Y of Central Maryland. When the SY2013-2014 kindergarten cohort was ages 3 to 4, the only grantee was the Mayor & City Council Baltimore City Head Start and Early Head Start as well as the Maryland Family Network Early Head Start. The data used in this study were solely from the Mayor & City Council Baltimore City Head Start.
[19] https://www.baltimorecityschools.org/pre-k-and-k

Question 1: To what extent did young children have access to publicly funded early childhood services?

Despite the importance of early childhood services in improving children's long-term developmental outcomes (Yoshikawa et al., 2013), many families, particularly in low-income communities, still decline participation and/or are not aware of available services (Connolly & Olson, 2012). Thus, understanding enrollment patterns can contribute to more equitable and effective service distribution by identifying underserved populations. Table 8 shows the number of the SY2013-2014 and SY2014-2015 first-time kindergartners who appeared in each ECDC program enrollment data. The findings across two cohorts were similar. About 200 children each year were enrolled in the M&I home visiting program. This report does not represent the current city-wide home visiting programs though. The home visiting model evolved since this time period, and the data system for the home visiting programs has been improved significantly. Thus, future studies need to incorporate more recent data to understand the holistic picture of home visiting participating.

About 12% of children each year participated in BITP, designed to support young children with developmental delay(s). Because of the limited seats available in EHS before the expansion[Error! Bookmark not defined.], we observed only 2% of children who attended EHS. Given the importance of early care and education for infants and toddlers, particularly for those in poverty (Institute of Medicine and National Research Council, 2000; U.S. Department of Health and Human Services, Administration for Children and Families, 2010), ensuring that there are sufficient seats in EHS is critical. About 30% of first-time kindergartener attended HS, and 56% of the first-time kindergartners attended PreK.

The prenatal services offered by EHS are related to prenatal care birth outcomes for vulnerable children, which fosters the kind of long-term health and functioning in children that supports social and cognitive development (U.S. Department of Health and Human Services, Administration for Children and Families, 2010). Related services include prenatal education, referrals for prenatal care, and transportation to prenatal appointments. Parents who receive services from HS and EHS tend to show more positive parenting practices, including more reading aloud, praise, and less spanking (Fernandez, 2007; Bauer & Schanzenbach, 2016).

Table 6. First-time Kindergartners Enrolled in Each ECDC Program

	Cohort 1 (N=7,447)		Cohort 2 (N=7,357)	
Program	**n**	**%**	**n**	**%**
Maternal & Infant Care Program (M&I)	223	3%	213	3%
Baltimore Infants and Toddlers Program (BITP)	886	12%	881	12%
Early Head Start	142	2%	152	2%
Head Start	2,058	28%	2,137	29%
Public PreK	4,200	56%	4,098	56%

Note. Cohort 1 is the SY2013-2014 first-time kindergartners and Cohort 2 is the SY2014-2015 first-time kindergartners.

Table 9 shows the number of children enrolled in at least one ECDC program. It is heartening to observe that about 74% of children each year had access to at least one ECDC program. Children who accessed at least one ECDC program were more likely to be born in Baltimore than elsewhere (81%; among children who did not access ECDC programs, only 59% were born in Baltimore). Thus, it is possible that when children are born in Baltimore, they are more likely to be better referred to appropriate services. Given the similarities between the two cohorts, we reported the findings from the first cohort (SY2013-2014 first-time kindergartners) in the following sections. No differences between the two cohorts were found in the following analyses.

Table 7. First-time Kindergartners' Enrollment in ECDC Programs

	Cohort 1 (N=7,447)		Cohort 2 (N=7,357)	
Enrolled in:	**n**	**%**	**n**	**%**
At least one ECDC program	5,503	74%	5,411	74%
No ECDC program	1,944	26%	1,946	26%

Question 2: What are the characteristics of children and families who accessed publicly funded early childhood services?

Before we answer this question, we first looked at the characteristics of the SY2013-2014 first-time kindergartners cohort by matching their data with vital statistics. We only included children who were born in Baltimore for this analysis (*n* = 5,599) because the vital statistics data were not available for those not born in Baltimore. Table 10 shows that 83% of mothers of the kindergartners were Black, non-Hispanic. About 66% of mothers had a high school diploma/GED or more at the time of birth, and 71% of mothers were receiving income-based medical assistance at the time of the child's birth. We also highlighted that 23% of the kindergartners were born to adolescents who were 19 years or younger. About 13% of babies were born premature or had low birth weight. When the SY2013-2014 cohort children who were born in Baltimore entered kindergarten, 4% of children received ELL services and 10% received special education services in kindergarten. Linking children's census tract information at birth with the U.S. Census American Community Survey (ACS) 2010 data (5-year estimates), we found that 72% of families lived in the neighborhoods having poverty rates at 20% or more and about 35% of families lived in the neighborhoods having poverty rates at 40% or more.

Table 8. Characteristics of SY2013-2014 First-time Kindergartners Born in Baltimore, N = 5,599

	N	Total %
From Vital Statistics Data:		
Mothers' race/ethnicity[a]		
Hispanic/Latina	343	6.1%
Black, non-Hispanic	4,645	83.0%
White, non-Hispanic	550	9.8%
Mothers' education attainment at birth		
Less than High School	1,881	33.7%
High School Graduate	2,353	42.2%
More than High School	1,341	24.1%
Received medical assistance at birth	3,985	71.2%
Teen mother at birth (19 years or younger)	1,295	23.1%
Baby preterm at birth	757	13.6%
Low birth weight	747	13.3%
From Baltimore City Public Schools Data:		
Received ELL services	239	4.3%
Received Special Education	539	9.6%
Child female	2,800	50.0%
Child male	2,799	50.0%
From Census Tract Data:		
Lived in concentrated poverty area at birth		
20% poverty	3,947	72.0%
40% poverty	1,892	34.5%

[a]Other race categories were omitted due to the limited cell sizes.

Then, we explored the characteristics of children and families enrolled in ECDC programs. Table 11 compares the children and families who participated in at least one ECDC program with those who did not. In general, ECDC programs had families and children who had greater needs (e.g., more likely to receive medical assistance, live in neighborhoods with concentrated poverty, have preterm birth or low birth weight). ELLs were less likely to participate in the ECDC programs compared to non-ELLs. Because the data are from the 2007-2008 birth cohort, it is possible that the ELL services have been expanded over the last decade, as we see a growing population of ELLs in Baltimore. However, service providers should still examine outreach and provision to ELL families. See Appendix 3.1 for the characteristics of children and families enrolled in each ECDC program.

Table 9. Comparison between Children who Participated in At Least One ECDC Program Versus None

	Participated (N=4,451)		Not participated (n=1,148)		one vs none
	N	**%**	**N**	**%**	**Sig. level**
From Vital Statistics Data:					
Mothers' race/ethnicity[a]					***
Hispanic/Latina	283	6.4	60	5.2	
Black, non-Hispanic	3,807	85.5	838	73.0	
White, non-Hispanic	319	7.17	231	20.1	
Mothers' education attainment at birth					***
Less than High School	1,518	34.3	363	31.8	
High School Graduate	1,940	43.8	413	36.1	
More than High School	974	22.0	367	32.1	
Received medical assistance at birth	3,262	73.3	723	63.0	***
Teen mother at birth (19 years or younger)	1,035	23.3	260	22.7	n.s
Baby preterm at birth	640	14.4	117	10.2	***
Low birth weight	614	13.8	133	11.6	*
***From City Schools Data*:**					
Received ELL services	287	5.2	150	7.7	***
Received Special Education	582	10.6	117	6.0	***
Child female	2,713	49.3	954	49.1	n.s
Child male	2,790	50.7	990	50.9	n.s
From Census Tract Data:					
Lived in concentrated poverty area at birth					
20% poverty	3,228	74.0	719	64.0	***
40% poverty	1,565	35.9	327	29.1	***

[a]Other race categories were omitted due to the limited cell sizes. n.s. = not significant.

***$p < .001$; *$p < .05$

Question 3: What are the most common pathways from birth to kindergarten that children go through using publicly funded early childhood services?

By exploring service pathways, we can reveal potential gaps in children's participation in publicly funded early childhood services, paving the way to maximize coordination and collaboration across early childhood and other social service programs and between early childhood programs and public K-12 education.

By cross-linking the ECDC data, we found that the following pathways between birth and kindergarten were the most common for the SY2013-2014 first-time kindergarten cohort. For this analysis, we did not restrict the sample to those who were born in Baltimore. This analysis includes the entire cohort.

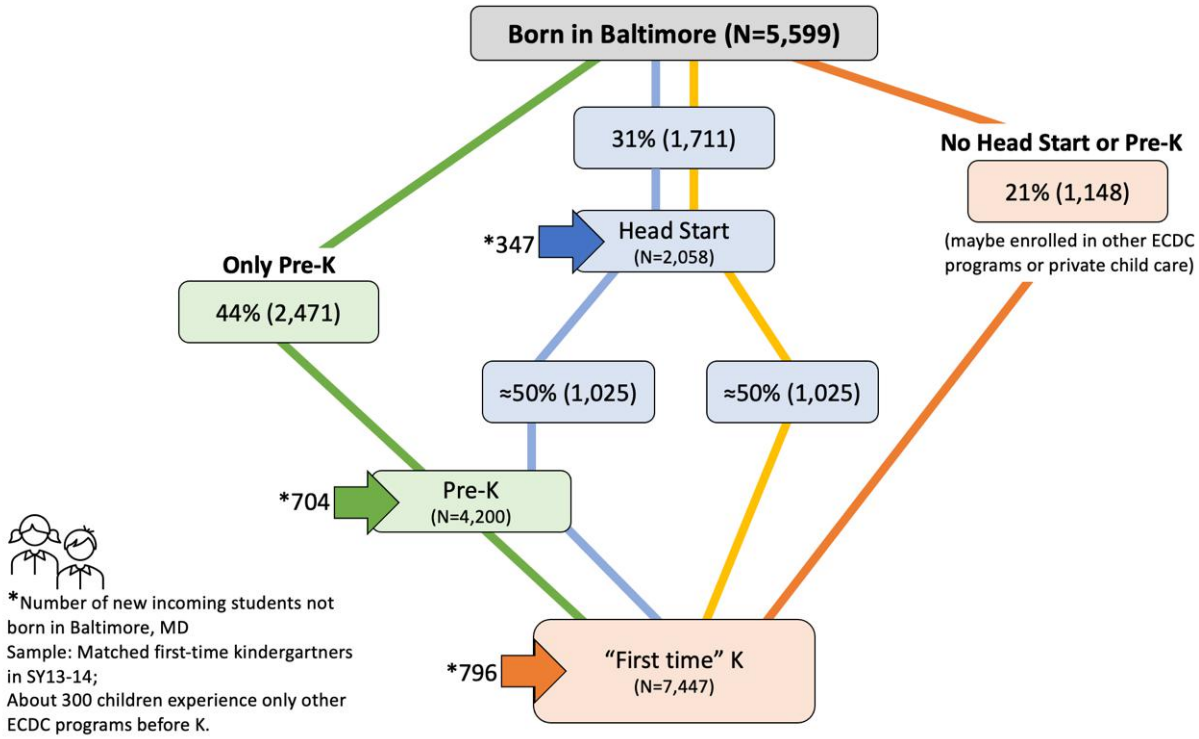
- Only PreK (n = 2,739, 37%)
- No ECDC public programming (n = 1,944, 26%)
- HS and PreK (n = 1,025, 14%)
- Only HS (n = 815, 11%)
- BITP and PreK (n = 484, 7%)
- Only BITP (n = 216, 3%)

After PreK only, the most common pathways included no enrollment or enrollment in HS and/or PreK. Among the BITP participants (*n* = 886), about half of the children went to PreK (n = 484). The EHS and M&I participation does not appear in this list due to the limited seats available during the time the data were collected.

Appendix 3.2 shows further details on how each ECDC program relates to the others in children's and families' usage. Only 3.5% of Early Head Start participants did not appear in other ECDC programs. In addition, 75% of the BITP participants and 60% of the HS participants participated in at least one other ECDC program. It appears that about 65% of PreK students did not use any other ECDC programs. Possibly, a large proportion of families enrolled in PreK were not income-eligible for using other ECDC programs, such as EHS and HS programs; or families might simply have not been eligible for the M&I or BITP programs. To incorporate income eligibility, a more comprehensive dataset including families' income data is needed.

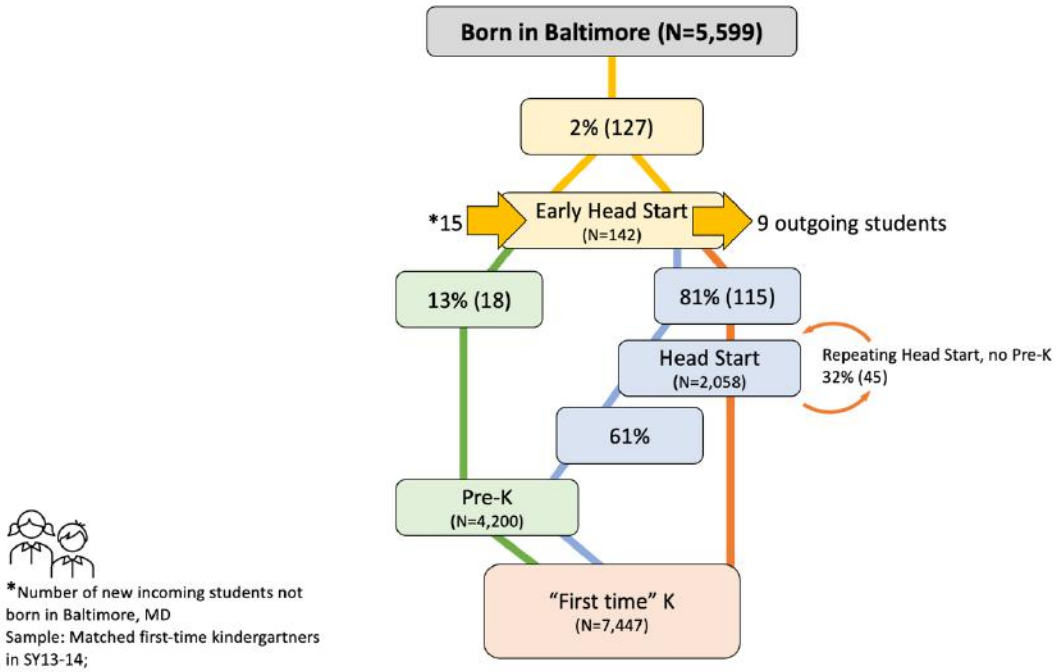
Because children most frequently used HS and PreK, we further examined these pathways. As shown in Figure 33, among the 7,447 first-time kindergartners, 5,599 children were born in Baltimore. Among those born in Baltimore, 31% of the children attended HS (mostly at age 3). Then, half of the children continued to be enrolled in HS and the rest went to PreK. Another 44% of children born in Baltimore directly went to PreK and 21% of children did not attend HS or PreK. Children who did not attend HS or PreK might have utilized private early care and education services (e.g., child care centers, family child care providers, nursery schools, etc.) because the ECDC data only captures publicly-funded programming.

Figure 33. HS and PreK Experiences of First-time Kindergartners in SY2013-2014



EHS use by the SY2013-2014 kindergarten cohort does not generalize to the current program because of its significant expansion in the interim. Still, we examined the pathway of this cohort's EHS participants. As shown in Figure 34, about 81% of EHS participants went to HS after EHS. Another 13% continued on to PreK, though it is possible that those children used other programs or home care between the ages of three and four. With more comprehensive data collection, future analyses can examine children's pathways in greater detail.

Figure 34. EHS Experiences of First-time Kindergarteners in SY2013-2014



Question 4: To what extent are the pathways associated with children's long-term outcomes up to 5th grade?

Using the common pathways found from Question 3, we examined whether the pathways are related to children's long-term outcomes. We analyzed the following pathways:

- No exposure to ECDC programs from birth to age 5
- Participated in at least one ECDC program from birth to age 5
- Only attending HS
- Only attending PreK
- Attending both HS and PreK
- No exposure to HS or PreK

We used the following outcomes:

- Attendance from kindergarten through 5th grade
- KRA in kindergarten
- 3rd grade and 5th grade repetition

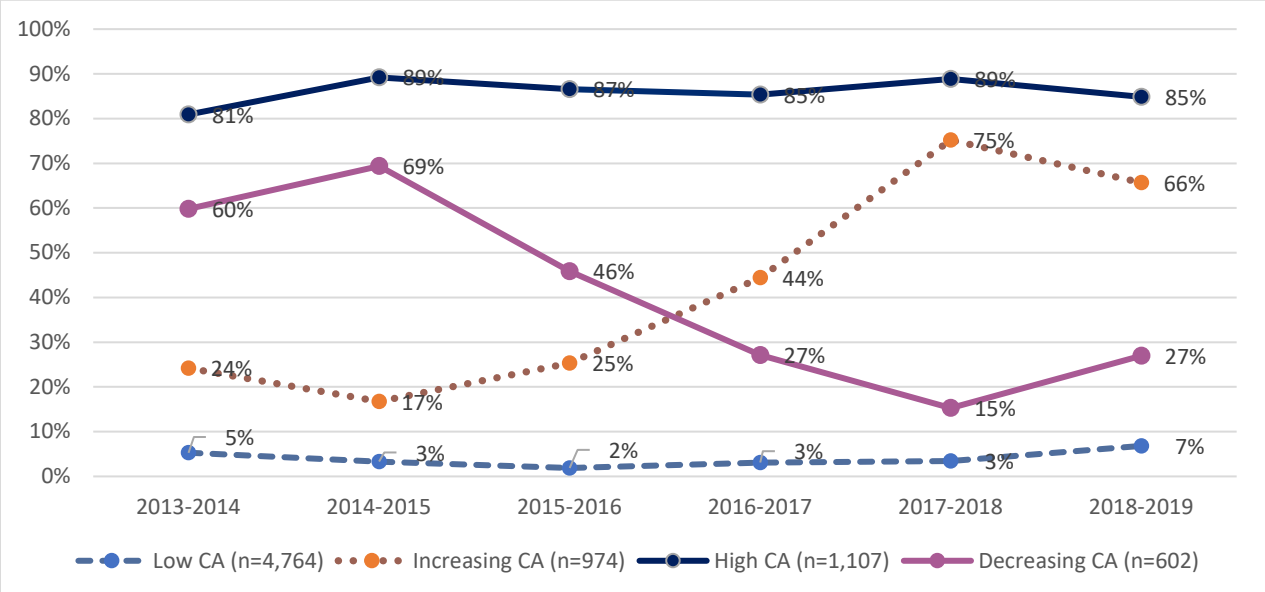
Early Childhood Pathways and Attendance

We used the SY2013-2014 first-time kindergartners as our sample for the analyses. The outcomes were available through 5th grade for this cohort. Then, we repeated the analyses with the SY2014-2015 sample (outcomes available through 4th grade) to examine whether there were any differences between two cohorts. As the results were similar, we reported only the findings from the SY2013-2014 cohort.

Children's Attendance Patterns

We first examined the patterns of children's attendance from kindergarten through 5th grade. We conducted a latent class analysis to create groups of children who share similar attendance patterns longitudinally. As shown in Figure 35, we found four different groups who had unique attendance patterns. First, the most observed pattern (*n* = 4,764) was having low chronic absenteeism[5] (CA) across 6 years from kindergarten to 5th grade. Only 2% to 7% of the children in this group had chronic absenteeism each year. This group was named **"Low CA"** group. Second, there was a group of children who had a high chronic absenteeism rate in kindergarten and the high chronic absenteeism pattern persisted over time (*n* = 1,107), which we call **"High CA"** group. About 80% to 90% of the children in this group had chronic absenteeism each year. Third, we found a group of children whose chronic absenteeism is not high in the first three years, but increased over time (*n* = 974). We named this group **"increasing CA"**. The increased chronic absenteeism rate might be related to their life events in later grades. Fourth, there was a group of children who had greater than average chronic absenteeism rate in kindergarten (60%), but the rate decreased over time, which we call **"decreasing CA"** group (*n* = 602). This pattern is commonly observed in the literature, as a common cause of CA in younger grades is health or other problems with parents (Ehrlich et al., 2014; Sugrue et al., 2016), who need to accompany young children to and from school. In older grades, children are more likely to get themselves to school, so parent problems are less of a factor.

Figure 35. Attendance Patterns from Kindergarten to 5th Grade since SY 2013-2014



Using the four attendance patterns, we conducted a series of analyses to examine whether children's enrollment in HS and/or PreK is related to the attendance patterns. To account for families' economic status, which is related to income eligibility for HS enrollment and the PreK priority system at City Schools, we used medical assistance status at birth and concentrated neighborhood poverty as proxy variables. Thus, we compared six groups of children (no ECDC programming, at least one ECDC programming, only attending HS, only attending PreK, attending both HS and PreK, and no exposure to HS or PreK) using (a) a subsample of children born to mothers who received medical assistance at birth, and (b) a subsample of children living in concentrated poverty areas (20% or greater poverty rate) at birth. In addition, we used a subsample of children born to teen mothers recognizing the importance of support that teen mothers may additionally need.

Table 12 shows the comparison between children not enrolled in any ECDC programs between birth and age 5 and those who participated in at least one ECDC program. The chi-square test shows that children's attendance patterns differed by the ECDC enrollment status. Among children whose mothers had medical assistance at birth, those enrolled in at least one ECDC program were more likely to belong to the Low CA group (56%) compared to those not enrolled in ECDC programs (51%). In addition, children enrolled in at least one ECDC program were less likely to belong to the High CA group over six years since they enter kindergarten (18%) compared to those not enrolled in the ECDC program (24%). The difference between the two groups in Increasing CA or Decreasing CA patterns was less salient. Note that the full sample size and percentages for each cell is provided in Appendix 3.3.

Table 10. ECDC Enrollment and Attendance Patterns Using a Subsample of Children Born to Mothers Who Received Medical Assistance at Birth

		Mothers Received Medical Assistance at Birth				
		Low CA	High CA	Increasing CA	Decreasing CA	Statistically Significant Differences
No ECDC programming	%	50.07	24.07	14.38	11.48	***
At least one ECDC programming	%	56.07	17.93	16.03	9.96	
Total avg.	%	54.98	19.05	15.73	10.24	

Note. CA = Chronic Absenteeism. ***p<.001

Table 13 shows the comparison between children who attended only HS, only PreK, both HS and PreK, and those who did not attend HS or PreK. Among children whose mothers had medical assistance at birth, those who were enrolled in both HS & PreK were more likely to belong to the Low CA group (60%) compared to those who did not attend HS or PreK (49%). In addition, they were less likely to belong to the High CA group (14%) compared to those who were not enrolled in either program (25%). Students who were only exposed to either HS or PreK were also more likely to have better attendance compared to those who were not enrolled in either program. There were no significant differences between the groups for the Increasing CA and Decreasing CA patterns.

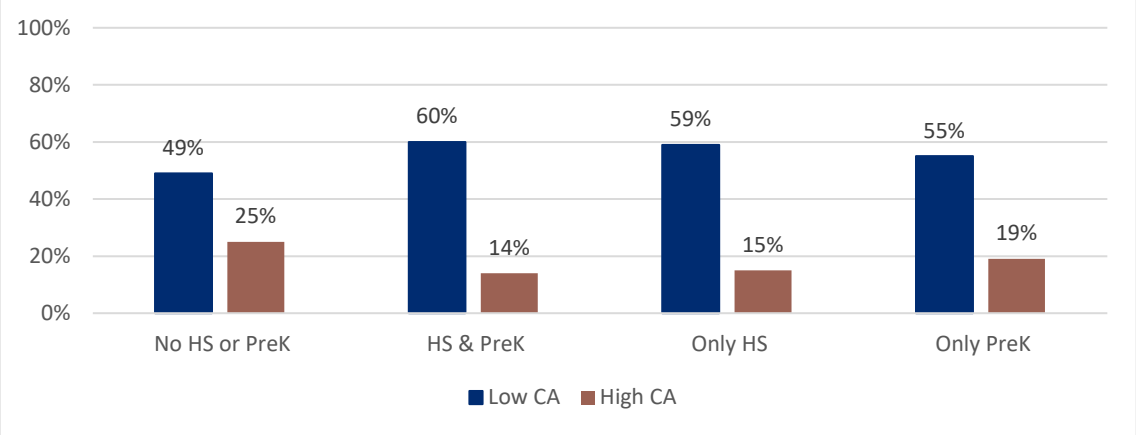
Table 11. HS and PreK Enrollment and Attendance Patterns Using a Subsample of Children Born to Mothers Who Received Medical Assistance at Birth

		Medical Assistance at Birth				
		Low CA	High CA	Increasing CA	Decreasing CA	Statistically Significant Differences
No HS or PreK	%	48.74	25.19	14.57	11.5	***
Only HS	%	58.61	15.11	16.77	9.52	
Only PreK	%	55.03	19.21	15.86	9.9	
HS & PreK	%	59.68	14.22	15.98	10.12	
Total avg.	%	54.98	19.05	15.73	10.24	

Note. CA = Chronic Absenteeism. ***$p < .001$

Figure 36 summarized the Low CA and High CA group patterns from Table 11. When children did not have exposure to HS or PreK, particularly for those born to mothers with medical assistance at birth, they were more likely to have high chronic absenteeism through 5th grade. This implies that publicly funded early childhood programs promote children's long-term attendance. Given the importance of attendance in children's development (Woldehanna & Gebremedhin, 2012; Zhai et al., 2011), it is important to invest in early childhood programs to facilitate long-term developmental trajectories.

Figure 36. HS and PreK Enrollment and Attendance Patterns Using a Subsample of Children Born to Mothers Who Received Medical Assistance at Birth



In Table 14, we repeated the same analyses as Table 12 and Table 13 using a subsample of children who lived in concentrated poverty areas (CSA with 20% or greater poverty rate) at birth. We found the same patterns that children who were enrolled in at least one ECDC program were more likely to belong to the Low CA group (60%) compared to those who were not enrolled in ECDC programs (56%). In addition, children who were enrolled in at least one ECDC program were less likely to belong to the High CA group (16%) compared to those who were not enrolled in the ECDC program (20%).

Furthermore, among children living in concentrated poverty areas at birth, those enrolled in both HS & PreK were more likely to belong to the Low CA group (63%) compared to those who did not attend HS or PreK (54%). In addition, they were less likely to belong to the High CA group (12%) compared to those not enrolled in either program (21%). Students who were only exposed to either HS or PreK were also more likely to have better attendance compared to those not enrolled in either program.

Table 12. EDCD, HS, and PreK Enrollment and Attendance Patterns Using a Subsample of Children Lived in Concentrated Poverty Areas at Birth

		Concentrated Poverty in Neighborhood (20% poverty rate)				Statistically Significant Differences
		Low CA	High CA	Increasing CA	Decreasing CA	
No ECDC programming	%	56.33	20.31	13.35	10.01	***
At least one ECDC programming	%	59.57	15.52	15.77	9.14	
No HS or PreK	%	54.63	21.37	13.74	10.25	***
Only HS	%	61.47	13.26	16.69	8.58	
Only PreK	%	58.86	16.46	15.54	9.15	
HS & PreK	%	62.98	12.29	15.67	9.06	
Total avg.	%	58.98	16.39	15.33	9.3	

Then, Table 15 repeated the same analyses using a subsample of children born to teen mothers. Again, we found the same patterns that children enrolled in at least one ECDC program were more likely to belong to the Low CA group (51%) compared to those not enrolled in ECDC programs (45%). In addition, children enrolled in at least one ECDC program were less likely to belong to the High CA group (21%) compared to those not enrolled in the ECDC program (24%).

Interestingly, comparing children's enrollment in HS and/or PreK, children born to teen mothers were most likely to belong to the Low CA group (54%) and least likely to belong to the High CA group (17%) when they attended only HS. In addition, children who attended only PreK or HS and PreK had better attendance patterns compared to those who did not attend either HS or PreK (46% for Low CA and 26% for High CA). Research shows that the high family engagement in HS programs is linked to better child and parenting outcomes, including parental sensitivity and parental engagement with children (Jeon et al., 2020). In the study, outcomes for children included fewer behavior problems, social competence, cognitive development, and language abilities (Jeon et al., 2020). HS's two-generational approach incorporates a number of resources and supports, which is particularly effective for teen mothers looking to navigate child-rearing (Rafferty et al., 2011). The results in Table 15 confirm the findings from the literature. Appendix 3.4 includes the full data using this subsample.

Table 13. EDCD, HS, and PreK Enrollment and Attendance Patterns Using a Subsample of Children Born to Teen Mothers

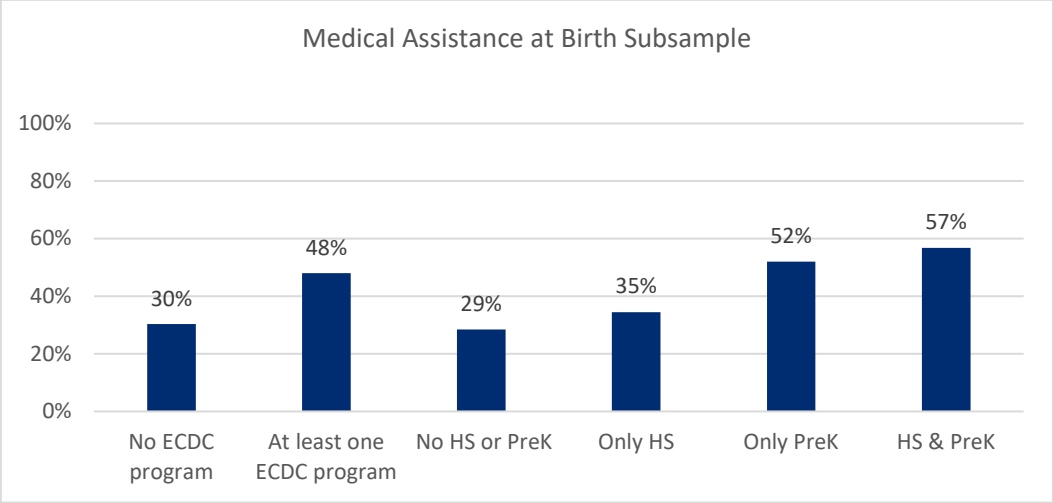
		Born to Teen Mothers				Statistically Significant Differences
		Low CA	High CA	Increasing CA	Decreasing CA	
No ECDC programming	%	44.62	23.85	16.15	15.38	***
At least one ECDC programming	%	50.63	20.77	15.75	12.85	
No HS or PreK	%	45.51	25.7	14.86	13.93	***
Only HS	%	53.57	17.41	16.96	12.05	
Only PreK	%	49.1	21.58	15.47	13.85	
HS & PreK	%	52.08	18.23	17.19	12.5	
Total avg.	%	49.42	21.39	15.83	13.36	

Children's KRA

We further examined children's KRA results based on the ECDC enrollment status and HS/PreK enrollment status using the same six groups: no exposure to ECDC programs from birth to age 5; participated in at least one ECDC program from birth to age 5; only attending HS; only attending PreK; attending both HS and PreK; and no exposure to HS or PreK described in the previous section. We used only the same subsample of children (a) whose mothers had medical assistance at birth, (b) who were living in the concentrated poverty areas (20% or greater), and (c) who were born to teen mothers.

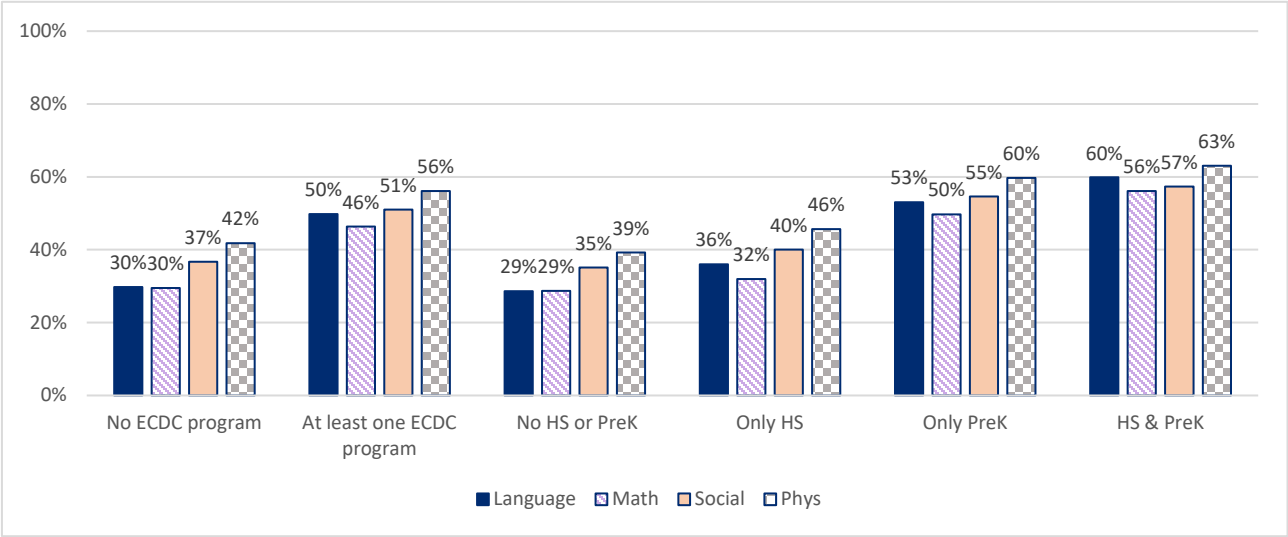
Among children born to mothers who had medical assistance at birth, as shown in Figure 37, 48% of children who attended at least one ECDC program from birth to age 5 demonstrated readiness, measured by KRA, whereas only 30% of children demonstrated readiness when they did not use any ECDC programs. Furthermore, children who had both HS and PreK exposure demonstrated the best KRA outcome, followed by those who attended PreK only, HS only, and had no exposure to HS or PreK.

Figure 37. Proportion Demonstrating Readiness by ECDC, HS, and PreK Enrollment Using a Subsample of Children Born to Mothers Who Received Medical Assistance at Birth



Looking at KRA scores by subscales, we found similar patterns (Figure 38). Particularly, the gaps between children who participated in both HS and PreK and those who did not participate in either HS or PreK were large in the literacy and mathematics subscales.

Figure 38. Proportion Demonstrating Subscales Readiness by ECDC, HS, and PreK Enrollment Using a Subsample of Children Born to Mothers Who Received Medical Assistance at Birth

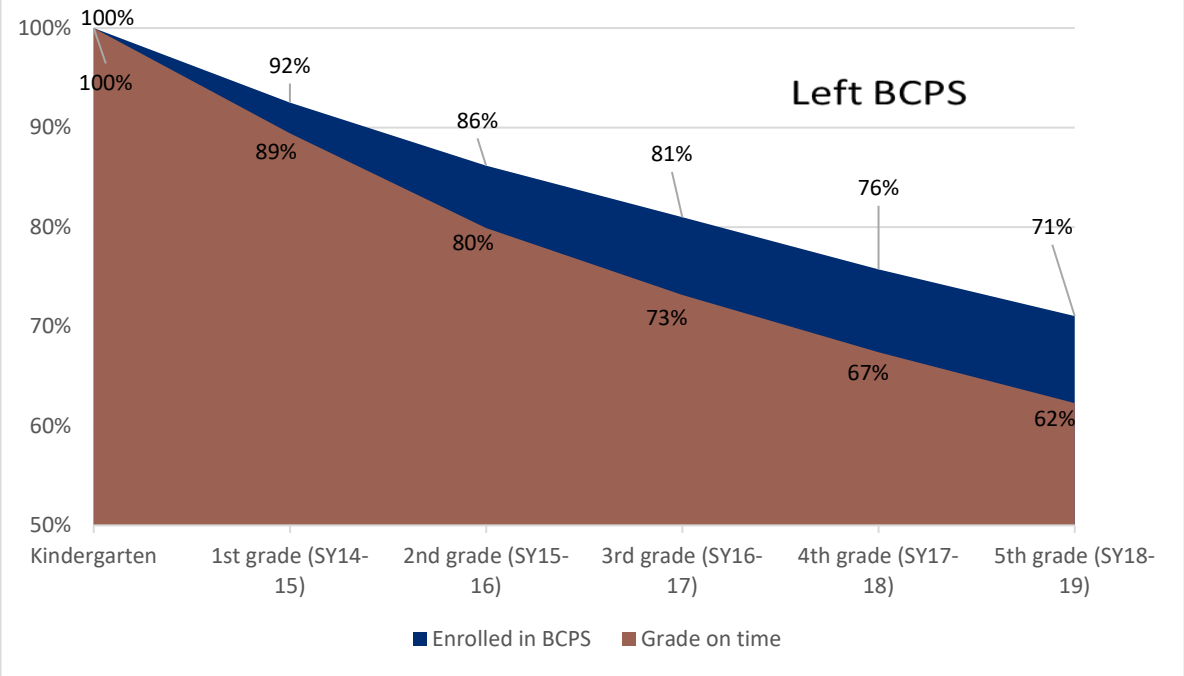


We found similar patterns using a subsample of children who were living in concentrated poverty areas and who were born to teen mothers. The full data are shown in Appendix 3.5. **The results indicate that publicly funded early childhood programs promote children's kindergarten readiness measured by KRA. It would be worth considering private childcare programming in addition to publicly funded programming in future studies.**

Children's Grade Repetition Over Time

In 2016, the National Center for Education Statistics[20] showed that about 1.6% of students were retained in grades K-8. Compared to the national average, the grade repetition rates are high in Baltimore City, as shown in Figure 39. About 30% of the SY2013-2014 first-time kindergartners who left City Schools between kindergarten and 5th grade in SY2018-2019. Among students who remained in City Schools, about 9% of the first-time kindergartners had grade retention at least once up to 5th grade. Previous research shows that early grade retention is negatively related to children's long-term academic achievement as well as behavioral adjustment (Pagani et al., 2001; Silberglitt et al., 2006). Thus, it is important to think about how the early childhood system in Baltimore can prevent grade repetition to support children's long-term developmental trajectories.

Figure 39. City Schools Enrollment and On-Time Grades for the SY2013-2014 First-time Kindergartners (N=7,447)



Note. The enrollment and on-time grades patterns were found to be similar among the SY2014-2015 first-time kindergartners (N=7,357).

In this report, we first explored children's grade retention at 3rd and 5th grades by their enrollment in ECDC programs, using the subsamples of children (a) whose mothers had medical assistance at birth, (b) who were living in the concentrated poverty areas (20% or greater), and (c) who were born to teen mothers. As shown in Table 16, children who participated in at least one ECDC program were more likely to be promoted on time each year through 3rd grade compared to those who did not participate in ECDC programs using all three subsamples. Table 17 shows similar patterns that among children whose

[20] https://nces.ed.gov/programs/raceindicators/indicator_rda.asp

mothers had medical assistance at birth and who were living in neighborhoods with concentrated poverty, when children participated in at least one ECDC program, they were more likely to be promoted on time each year through 5th grade compared to those who did not participate in ECDC programs. The significant difference in grade promotion between these two groups was not prevalent in children who were born to adolescents.

Table 14. ECDC Experiences and 3rd Grade On-time Grade Rates

		Medical Assistance at Birth	***Concentrated Poverty In Neighborhood (20% poverty rate)***	***Teen Mothers at Birth***
No ECDC programming	%	84.46	85.14	82.57
At least one ECDC programming	%	89.22	89.98	87.89

Note. All differences between two groups (no ECDC programming vs. at least one ECDC programming) were statistically different.

Table 15. ECDC Experiences and 5th Grade On-time Grade Rates

		Medical Assistance at Birth	***Concentrated Poverty In Neighborhood (20% poverty rate)***	***Teen Mothers at Birth***
No ECDC programming	%	80.41	81.65	80.51[a]
At least one ECDC programming	%	85.97	86.97	84.89[a]

Note. The differences between two groups (no ECDC programming vs. at least one ECDC programming) were statistically different for the subsamples of children whose mothers had medical assistance at birth and who were living in the concentrated poverty areas (20% or greater).
[a]The difference was not statistically significant.

Table 18 and Table 19 show the differences between children who did not have HS or PreK exposure, who only attended HS, who only attended PreK, and who attended both HS and PreK using the same three subsamples of children. The data shows that the on-time grade promotion rates in 3rd grade were highest for children who attended both HS and PreK, followed by the only HS group and the only PreK group. Children who did not attend HS or PreK among these subsamples were most likely to have repeated a grade level before they entered 3rd grade.

Table 16. HS and/or PreK Experiences and 3rd Grade On-time Grade Rates

		Medical Assistance at Birth	***Concentrated Poverty In Neighborhood (20% poverty rate)***	***Teen Mothers at Birth***
No HS or PreK	%	83.12	84.14	81.11
Only HS	%	89.57	90.96	92.27
Only PreK	%	88.98	89.85	86.94
HS & PreK	%	92.49	92.08	89.63

Note. All differences were statistically significant tested by the chi-square test statistics.

Similar patterns were found using the 5th grade on-time grade promotion rates. For children whose mothers had medical assistance at birth, and who were living in poverty concentrated areas, the on-time grade promotion rates in 5th grade were highest for children who attended both HS and PreK, followed by the only HS group and the only PreK group, and the no exposure group. However, for children born to adolescents, children who only attended HS were most likely to have on-time grade promotion by 5th grade, followed by the HS and PreK group, the only PreK group, and the no exposure group. This trend was also found in examining children's long-term attendance patterns. This may be related to HS curricula's family engagement efforts and the two-generational approach that supports young parents.

Table 17. HS and/or PreK Experiences and 5th Grade On-time Grade Rates

		Medical Assistance at Birth	***Concentrated Poverty In Neighborhood (20% poverty rate)***	***Teen Mothers at Birth***
No HS or PreK	%	78.83	80.71	78.33
Only HS	%	87.53	87.91	90.68
Only PreK	%	85.23	86.53	83.98
HS & PreK	%	89.87	89.92	86.23

Note. All differences were statistically significant tested by the chi-square test statistics.

The results from the grade repetition analyses confirm that publicly funded early childhood programs promote children's on-time grade promotion. Future studies may include a broader range of outcomes beyond attendance, KRA, and grade repetition to capture a more holistic picture of children's developmental trajectories.

LOOKING AHEAD:
CONCLUSIONS AND RECOMMENDATIONS

This report explores potential opportunity gaps between the provision of services and the needs of families with young children. The findings suggest various ways for early childhood service agencies to collectively work towards children's success. **We suggest using the findings to help providers distribute services equitably, track trends for families with young children, enhance service quality, and improve outcomes over time.** In addition, we encourage the stakeholders to **refresh the analysis annually or bi-annually**.

In **Chapter 1**, we described characteristics of babies born in Baltimore and their birthing parents.

Overall, there have been sizable decreases in birth rates over time (21% decrease from 1996 to 2019). This is likely related to decreased City Schools enrollment over time as well. However, rates of birth are inconsistent with decreases in some neighborhoods and demographic groups. In particular, a decrease in the number of Black births is driving the overall downward trend. Also, the number of births to those young adults ages 15-19 and to those with only a high school diploma and has decreased more than births to those older or with more education. Efforts should be made to examine what leads to families starting and remaining in the city and improving family related services and activities to make raising families in Baltimore City an attractive prospect.

First, **Brooklyn/Curtis Bay/Hawkins Point needs further attention.** We identified this area as having an increasing number of Hispanic and Black babies and a high number of teen parents compared to other areas, while lacking accessible services. Stakeholders should carefully explore the location and accessibility of health care services, to determine if and where expansion or relocation may be appropriate, especially vis-a-vis areas of growth in population generally or births specifically.

Second, **the city needs investigation into the increasing rates of hypertension in pregnant individuals**. Note that our hypertension figures comprise chronic, gestational, and eclampsia hypertension types. The increase may be due to improved screening and detection, in which case it represents an improvement to health care. However, if not, it speaks to an urgent need for further attention. Nationally, hypertensive disorders were among the leading causes of pregnancy mortality, which is highest for Black, American Indian/Alaskan, and Asian/Pacific Islander women (Centers for Disease Control and Prevention, 2020).

We also note that **the rate of premature births has been steadily increasing both across the state and nationally**. Within the state of Maryland, the rate of premature birth is higher for Black (17.1%) and Latine/Hispanic (12.5) infants than for White infants (11.3%) (Maryland Department of Health Maternal and Child Health, 2014). As such, stakeholders should consider the importance of effective *language accommodations* and *translation services* for expectant and new mothers, and well as *cultural awareness training* for medical and services staff, to support the health and safety of mothers, infants, and children. Finally, additional reports using both quantitative and qualitative data may illuminate the

reasons behind the low full-term and birthweight, which are likely connected and thereby illuminate potential interventions.

To the extent that a goal is to maintain or grow Baltimore City's population, these data offer some preliminary suggestions. Given the trend of people with relatively higher levels of education having more births, absolutely and proportionately, there may be some "momentum" to chase by encouraging births among this group. It is still not clear whether this group continues to stay in the city as children grow and enter the school, however, it is important to track whether the population stays or leaves and find better ways to promote staying. Further, the city's efforts to attract immigrants may have been successful, given the growing Latine/Hispanic population, and that population's relatively high number of births. Special attention may be due to this group, which, as a growing population block, stands to contribute much to the city. Baltimore can only gain by involving this community in leadership, collaborating with community members as valuable stakeholders, and meeting Latine families' needs (e.g., dual language education programs, adult education).

The city's numbers on childhood poverty are worrisome, and bear continued attention. **The decrease in WIC use is concerning**, as WIC and other similar nutrition supplement programs are associated with improved outcomes for household finances and children. As WIC is federally funded, getting all eligible pregnant people and families enrolled may be relatively "low-hanging fruit" in Baltimore's effort to reduce child poverty. In order to maximize enrollment to benefit families, it would be worth exploring access and barriers to WIC in future examination. Along with WIC access, the city needs to consider other services and programs to address poverty in the city. For example, it is important to promote access to quality and affordable child care, increase workforce training and engagement, and/or promote stable and safe housing.

State and federal legislation (Kirwan Commission, social spending bill, respectively) may provide for funding to meet the needs of materially poor Baltimoreans. New funding opportunities could be used to improve children's lives from before they are born. There are great opportunities in this regard, including outreach to ensure prenatal care as early in pregnancy as possible. Prenatal care must address physical and mental health, as maternal stress is associated with preterm births and low birthweight (Loomans et al., 2013), and pregnancy-related stress is uniquely associated with preterm birth (Lobel et al., 2008).

In **Chapter 2**, we described children's experiences in kindergarten. We examined children's attendance, kindergarten repetition, and KRA findings to understand their overall experiences in kindergarten.

First, although the KRA is the most often used measure of kindergarten readiness, more indicators should be considered, such as attendance. The KRA has had many iterations over time and has not demonstrated strong validity with non-English speakers. In addition, it was not administered in 2020 due to the pandemic. Over time, other outcomes should be examined to determine if they are useful across various demographic groups.

Chronic absenteeism in kindergarten has been more pronounced in recent years. In the 2018-2019 school year, about 38% were chronically absent. It suggests that more efforts are needed to build

successful communications between families, children, and programs to understand the reasons behind this phenomenon. The disparity of absenteeism also resonates with children's performance in school readiness. It is still not clear how to improve children's attendance from the early years. To answer this question, future reports should examine the reasons for children's absence and understand families' perspectives on early childhood program attendance. For example, Early Head Start and Head Start programs collect the reasons for absence. In-depth analyses of those data will help understand effective intervention and prevention strategies.

Looking at KRA scores, children of color, English language learners, and children with a disability consistently demonstrated lower scores on KRA compared to their peers. Therefore, more support and resources should be provided to children with special needs, English language learners, and students of color. For instance, different language versions of the KRA may help children born into families that do not have English as their native language. This can help the process of holistically evaluating children's school readiness so that language skills do not become a disadvantage. Our comparison of boys and girls shows that performance on KRA was consistent with other empirical evidence of disparities between genders. Studies suggest that boys tend to exhibit disruptive and unfocused behavior (e.g., Broidy et al., 2003; Ready et al., 2005), which may be related to their classroom performance, cognitive function, as well as school readiness (Rapport et al., 2001). Educators may need additional training to understand how to appropriately differentiate their support for girls and boys.

Additionally, **kindergarten repetition as the strategy to improve children's school readiness may be reconsidered since limited evidence supports its long-term effectiveness**. Alternative interventions to strengthen children's comprehensive abilities and development could be implemented for first-time kindergarteners to reduce the number of students who repeat kindergarten.

Improving children's kindergarten readiness in Baltimore city requires the collaboration between and improvement of the whole communities and programs. We note that since the administration of KRA 1.5 in 2015, children's school readiness performance in Baltimore city has lagged behind the average KRA results across the Maryland state. Thus, it is important to consider how to better support children in Baltimore city and keep them on track for school.

The data included in this report do not explain children's experiences during the COVID-19 pandemic. This was to avoid unintentional comparisons between data collected before and after the COVID-19 pandemic. Using this report as the baseline, **we recommend Baltimore City keep track of long-term trends of children's development.** This will help service providers understand targeted areas during the COVID-19 recovery process.

In **Chapter 3**, we described children's and families' access to publicly funded early childhood services and programs from birth to kindergarten. Furthermore, we examined how the birth to age 5 experiences are related to children's long-term outcomes.

Accessing early childhood services is essential for improving children's developmental trajectories. Through the work of Baltimore City's Early Childhood Data Collaborative (ECDC), established to understand young children's access to publicly funded early childhood services, longitudinal data has

been gathered to understand how service provision is related to attendance, kindergarten readiness, and long-term grade repetition. By understanding various aspects of children's experiences and developmental trajectories, we are better positioned to provide adequate support needed for young children and to figure out how to improve our measures and early childhood services (i.e., Maternal & Infant Care Program, Baltimore Infants and Toddlers Program, Early Head Start, Head Start, public Pre-Kindergarten). Using the ECDC data, we found that children who were enrolled in publicly funded early childhood programs demonstrate significantly better KRA scores, long-term attendance up to 5th grade, and higher 3rd and 5th grade promotion rates compared to those who were not enrolled in these programs. To promote children's school readiness, more publicly funded seats are needed in the city.

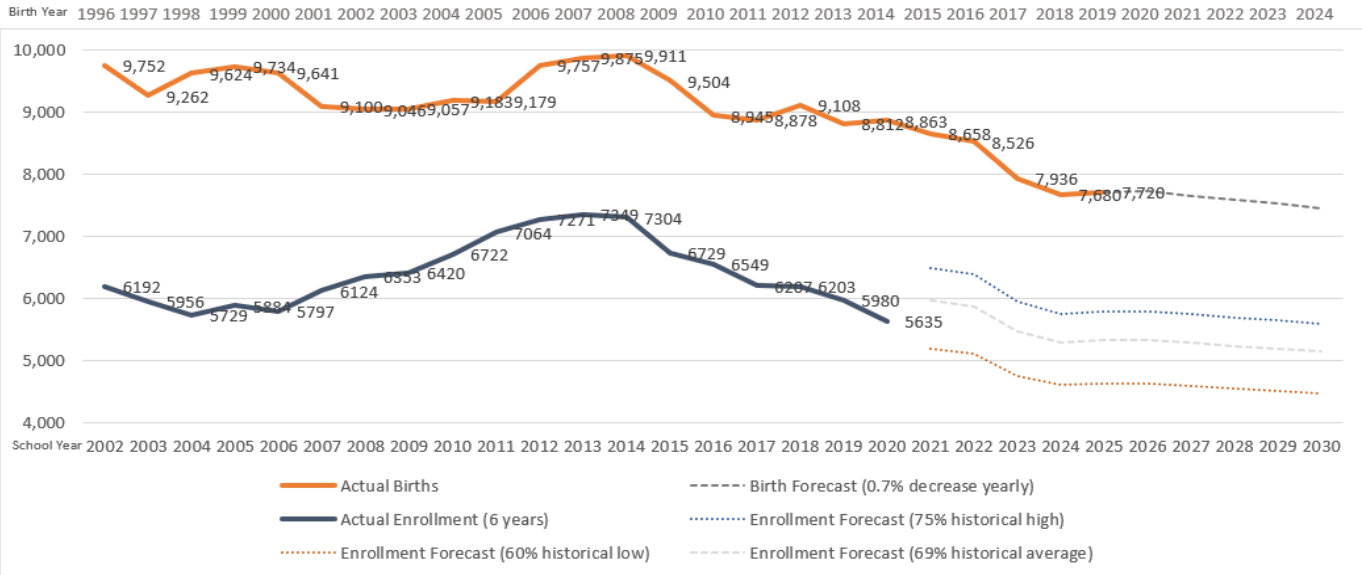
Multiple data sources above and beyond KRA (e.g., attendance) clarify the effectiveness of early childhood programming. Our results suggest that a *one size fits all* approach would not be ideal for young children. For example, the combination of Head Start and PreK appears to be most likely to promote children's KRA, long-term attendance, and 3rd and 5th grade on-time grade promotion in general. However, for children born to teen mothers, staying in Head Start at ages 3 and 4 was most helpful, particularly for long-term attendance. Because different data sources highlight different needs children and families may have, we encourage the city to use multiple data sources in future analyses.

We recommend the development of a more comprehensive data archive that incorporates all public and private services available for children and families. Note that ECDC is limited in its capacity to holistically understand the experiences of children and families because many still use private child care. In addition, there are other programs families may participate in that are not included here such as Judy Centers, Family Support Centers, local library programs, parent support programs, Infant and Early Childhood Mental Health services, and other insurance based programs (e.g. maternal mental, substance use treatment, family mental health programs). These programs are also likely to support families with young children and could factor into later outcomes for children. Therefore, they should also be included in data tracking efforts.

This effort will require in-depth understanding of each service available in the city, common child IDs used across each program or agencies (e.g., Zero to Five unique identifier in Maryland), coordination and collaboration between various services, and easy-to-use data system for each agency to record enrollment data. Incorporating information about private care can provide insight not only into development trajectories but other salient issues such as grade repetition. For children born outside of Baltimore, who may be less likely to be referred to appropriate services, it is important to incorporate their information into this comprehensive data system once they are enrolled in a service program. Once enrolled, children's attendance may be improved by building relationships with parents through improved two-generational approaches to family engagement, as well as closely monitoring any health concerns that may arise. Service programs must also seek to understand and address any additional needs of teen mothers and their children. Teen parenting classes or staff who focus on providing engagement and services to teen mothers might help in this effort.

More publicly funded seats are needed in the city. The Kirwin Commission's recommendations[21] for expanding ECE, to be implemented in 2023, include the expansion of full-day kindergarten, including free care for 3 and 4-year-olds from low-income households (i.e., up to 300% of the federal poverty level), and sliding scale rates for four-year-olds (300% to 600% of federal poverty level). Additionally, education staff in early care settings will receive financial support and tuition assistance for continuing education (e.g., pursuing degrees, earning additional credentials). Public funds will be allocated to community based, private, and public ECE programs. Judy Centers, as well Family Support Centers, which offer maternal care services, will be expanded, alongside full funding for the Infants and Toddlers Program. Regarding teacher compensation, there is a mandated 10% raise for teachers by 2024 with the starting salary for teachers to be $60,000 by 2026, including a $10,000 raise for National Board-Certified teachers and a $7,000 raise for National Board Certified teachers at low-performing schools (Maryland Association of Board of Education, 2021). By July 2022, the Maryland State Department of Education will develop a student data system for tracking and analyzing all student data provided to the State Board of Education by local school boards managing public schools (Maryland, 2020). The characteristics of the ECE workforce as well as how families participate in public PreK are soon to change. By the 2025-2026 school year, all providers will be required to have a bachelor's degree in any field or state certification for teaching in early education. Teaching assistants will be required to hold either an Associate's degree or a child development associate certificate. Families that earn incomes between 300% and 600% of the federal poverty line will pay a "family share" to publicly funded PreK providers, unless the local school system dictates otherwise (Maryland Association of Board of Education, 2021).

Figure 40. Kindergarten Enrollment Projection



Source: Publicly reported data from Maryland State Department of Education (https://www.marylandpublicschools.org/about/Pages/DCAA/SSP/index.aspx) and Maryland Department of Health (Vital Statistics and Reports; https://health.maryland.gov/vsa/pages/reports.aspx)

[21] https://www.mabe.org/wp-content/uploads/2021/11/Blueprint-for-Marylands-Future-Overview-and-Updates-10-21-.pdf

In preparation for the changes, all stakeholders must understand the birth to age 5 population of the city. It is obvious that the birth rate decreases in the city and this trend has implications for future early childhood services enrollment. Figure 40 shows our projection of the number of births over the next five years and the City Schools kindergarten enrollment project over the next ten years. The detailed projection data are included in **Appendix Table 4.1.** The table also includes the data on historical PreK enrollment.

The regression analysis showed that the number of births decreased by 0.7% yearly on average between 1996 and 2020. Using the rate of 0.7% decrease, we projected the number of births. We also calculated the historical rates of kindergarten enrollment by the number of births each year (i.e., kindergarten enrollment divided by the number of births 6 years before they enter kindergarten). Then, the total kindergarten enrollment was projected using three data points: (a) the historical highest rate of enrollment, 75%; (b) the historical lowest rate of enrollment, 60%; and (c) the historical average rate of enrollment, 69%. The three data points provide a range to project kindergarten enrollment. Although our analyses do not show Head Start or PreK enrollment projection, our findings show that 56% of kindergarteners attended PreK and 28% of kindergarteners attended Head Start in SY2013-2014 (Figure 33). From the 2017 to 2019 school years, about 70% of kindergartners attend PreK in City Schools. However, to ensure that every child is included in the PreK expansion plan, the kindergarten enrollment projection data should be the basis of projecting the number of needed seats for 3-year and 4-year old.

In conclusion, the report points to the importance of coordination and collaboration between multiple stakeholders. Young children and their families benefit from multiple services available in the city, and it is important to maximize their access to the services.

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APPENDICES

CHAPTER 1.

Appendix Table 1.1. Baltimore City CSAs in Descending Order of Percent Change in Births Between 2008 and 2018

CSA	Number of Births 2008	Number of Births 2018	Percent Change
South Baltimore	87	137	0.57
Canton	98	124	0.27
Orangeville/East Highlandtown	198	227	0.15
Cross-Country/Cheswolde	294	337	0.15
Highlandtown	131	146	0.11
Dickeyville/Franklintown	57	57	0.00
Downtown/Seton Hill	74	74	0.00
Mount Washington/Coldspring	69	68	–0.01
Claremont/Armistead	135	128	–0.05
Medfield/Hampden/Woodberry/Remington	228	212	–0.07
Fells Point	139	126	–0.09
Hamilton	150	135	–0.10
Forest Park/Walbrook	116	102	–0.12
Glen-Fallstaff	237	204	–0.14
Patterson Park North & East	305	259	–0.15
Brooklyn/Curtis Bay/Hawkins Point	298	252	–0.15
Inner Harbor/Federal Hill	173	145	–0.16
Southeastern	121	101	–0.17
Morrell Park/Violetville	146	119	–0.18
Allendale/Irvington/S. Hilton	262	211	–0.19
Lauraville	164	132	–0.20
Cherry Hill	164	130	–0.21
Midtown	110	87	–0.21
Greater Charles Village/Barclay	148	117	–0.21
Howard Park/West Arlington	119	93	–0.22
Greater Mondawmin	113	88	–0.22
Baltimore City	9,912	7,680	–0.23
Harford/Echodale	261	201	–0.23
Westport/Mt. Winans/Lakeland	165	124	–0.25
Oldtown/Middle East	189	141	–0.25
Chinquapin Park/Belvedere	131	97	–0.26
Cedonia/Frankford	375	277	–0.26
Loch Raven	223	163	–0.27

CSA	Number of Births 2008	Number of Births 2018	Percent Change
Greater Roland Park/Poplar Hill	65	47	–0.28
North Baltimore/Guilford/Homeland	154	110	–0.29
Poppleton/The Terraces/Hollins Market	93	66	–0.29
Belair-Edison	282	198	–0.30
Washington Village	94	66	–0.30
Edmondson Village	124	87	–0.30
Greater Govans	162	113	–0.30
Greenmount East	143	97	–0.32
Beechfield/Ten Hills/West Hills	204	138	–0.32
Upton/Druid Heights	219	145	–0.34
Sandtown-Winchester/Harlem Park	286	187	–0.35
Penn North, Reservoir Hill	169	109	–0.36
The Waverlies	130	82	–0.37
Pimlico/Arlington/Hilltop	186	112	–0.40
Northwood	199	119	–0.40
Greater Rosemont	365	213	–0.42
Dorchester/Ashburton	157	91	–0.42
Madison/East End	203	113	–0.44
Clifton, Berea	199	109	–0.45
Midway/Coldstream	195	106	–0.46
Southwest Baltimore	405	214	–0.47
Southern Park Heights	281	148	–0.47
Harbor East/Little Italy	103	49	–0.52

Source: Baltimore City Health Department

Appendix Table 1.18. Number and Proportion of Births by Mother's Education Attainment Level, 1999-2018

Year	Total	< HS	< HS %	HS	HS %	> HS	> HS%
1999	9,734	2,141	22	3,674	37.74	3,919	40.3
2000	9,641	2,148	22.3	3,692	38.29	3,801	39.4
2001	9,100	1,976	21.7	3,402	37.38	3,723	40.9
2002	9,046	1,958	21.6	3,352	37.05	3,737	41.3
2003	9,057	1,955	21.6	3,270	36.11	3,831	42.3
2004	9,183	1,903	20.7	3,318	36.13	3,962	43.1
2005	9,179	2,052	22.4	3,139	34.2	3,988	43.5
2006	9,757	2,124	21.8	3,386	34.7	4,247	43.5
2007	9,875	2,052	20.8	3,402	34.45	4,420	44.8
2008	9,911	1,987	20.1	3,416	34.47	4,508	45.5
2009	9,504	1,806	19	3,210	33.77	4,489	47.2
2010	8,945	1,775	19.8	2,700	30.19	4,470	50.0
2011	8,878	1,665	18.8	2,547	28.69	4,666	52.6
2012	9,108	1,710	18.8	2,599	28.53	4,799	52.7
2013	8,812	1,586	18	2,523	28.63	4,703	53.4
2014	8,863	1,499	16.9	2,640	29.79	4,723	53.3
2015	8,658	1,377	15.9	2,740	31.65	4,541	52.5
2016	8,526	1,404	16.5	2,553	29.94	4,569	53.6
2017	7,936	1,146	14.4	2,409	30.35	4,381	55.2
2018	7,680	1,171	15.3	2,304	30	4,206	54.7

Source: Baltimore City Health Department

Note: < HS means the mother's highest level of educational attainment was less than a high school diploma or GED; HS, a high school diploma or GED; > HS, more than a high school diploma or GED.

Appendix Table 1.19. Number of Births in Baltimore by Race and Ethnicity, 2000-2019

Year	Total Births	NH White	Black	American Indian	AAPI	Other Race	Hispanic Any Race
2000	9,641	2,229	7,034	23	111	60	195
2001	9,100	2,095	6,556	31	119	94	223
2002	9,046	2,030	6,553	22	111	91	251
2003	9,057	2,139	6,349	27	200	68	342
2004	9,183	2,154	6,434	13	175	11	415
2005	9,179	2,133	6,345	18	192	28	480
2006	9,757	2,199	6,777	14	204	29	553
2007	9,875	2,197	6,854	18	204	29	601
2008	9,911	2,280	6,736	20	228	37	634
2009	9,504	2,249	6,362	17	253	40	611
2010	8,945	2,225	5,867	15	240	3	600
2011	8,878	2,275	5,683	16	246	1	670
2012	9,108	2,414	5,758	19	288	11	628
2013	8,812	2,329	5,484	22	278	50	655
2014	8,863	2,273	5,472	27	283	29	793
2015	8,658	2,247	5,281	13	292	33	806
2016	8,526	2,205	5,152	16	259	85	826
2017	7,936	2,083	4,743	14	246	72	797
2018	7,680	2,023	4,469	9	251	72	872
2019	7,720	2,036	4,476	13	220	42	945

Source: Maryland State Department of Health

Note: NH is Non-Hispanic. AAPI is Asian-American/Pacific Islander. Other Race group comprises "unknown" or "other" and we derived it by subtracting identified groups from the total. Race/ethnicity counts protocols changed over time: Non-Hispanic White counts are available for all years; non-Hispanic Black, from 2010; non-Hispanic American Indian and AAPI, from 2015. These changes are reflected in gray shading, which denotes *total counts disregarding ethnicity*. Before 2015, Hispanic category overlapped with racial group counts.

Appendix Table 1.20. Proportion (%) of Births by Race and Ethnicity for each CSA, 2008 and 2018

CSA Neighborhood Names	2008				2018			
	Black NH	White NH	Other NH	Hisp. Any Race	Black NH	White NH	Other NH	Hisp. Any Race
Allendale/Irvington/S. Hilton	11.83	87.02	0.38	0.76	7.58	86.26	1.89	4.27
Beechfield/Ten Hills/West Hills	13.24	85.29	0.49	0.98	16.67	76.09	2.89	4.35
Belair-Edison	7.09	90.43	1.42	1.06	7.58	89.9	0.51	2.02
Brooklyn/Curtis Bay/Hawkins Point	49.66	35.91	1.68	12.75	25.79	42.86	2.38	28.97
Canton	83.67	5.1	3.06	8.16	85.48	4.03	7.26	3.23
Cedonia/Frankford	11.47	85.33	1.34	1.87	6.14	87.73	1.08	5.05
Cherry Hill	1.83	96.34	0	1.83	4.62	88.46	3.85	3.08
Chinquapin Park/Belvedere	19.85	69.47	3.05	7.63	19.59	59.79	7.22	13.4
Claremont/Armistead	27.41	57.04	0.74	14.81	13.28	60.16	1.56	25
Cross-Country/Cheswolde	76.87	14.63	5.78	2.72	81.31	12.76	2.37	3.56
Dorchester/Ashburton	0.64	96.82	1.28	1.27	2.2	89.01	5.5	3.3
Downtown/Seton Hill	24.32	50	21.62	4.05	27.03	41.89	24.32	6.76
Edmondson Village	0.81	97.58	0.81	0.81	5.75	89.66	1.15	3.45
Fells Point	57.55	9.35	6.48	26.62	65.08	3.97	12.7	18.25
Forest Park/Walbrook	7.76	91.38	0.86	0	1.96	94.12	1.96	1.96
Glen-Fallstaff	27.85	62.87	1.69	7.59	38.24	41.67	3.92	16.18
Greater Charles Village/Barclay	29.73	58.11	7.44	4.73	35.9	34.19	21.36	8.55
Greater Govans	8.64	88.27	1.85	1.23	7.96	88.5	0	3.54
Greater Mondawmin	2.65	97.35	0	0	2.27	95.45	0	2.27
Greater Roland Park/Poplar Hill	73.85	3.08	20	3.08	74.47	12.77	12.77	0
Greater Rosemont	0.82	98.36	0.55	0.27	1.88	96.24	0	1.88
Greenmount East	1.4	96.5	1.4	0.7	6.19	89.69	0	4.12
Hamilton	28	68	1.33	2.67	20.74	76.3	1.48	1.48
Harbor East/Little Italy	13.59	66.99	5.82	13.59	16.33	59.18	6.12	18.37
Harford/Echodale	29.89	62.45	2.3	5.36	24.38	70.15	1.99	3.48
Highlandtown	41.22	8.4	6.1	44.27	50	3.42	8.9	37.67
Howard Park/West Arlington	5.04	91.6	2.52	0.84	10.75	82.8	3.23	3.23
Inner Harbor/Federal Hill	79.77	12.72	5.2	2.31	77.93	11.03	6.21	4.83
Lauraville	25.61	71.95	0.61	1.83	26.52	65.91	1.52	6.06
Loch Raven	5.38	91.48	2.25	0.9	4.29	84.66	3.06	7.98
Madison/East End	3.45	90.15	0.98	5.42	12.39	63.72	5.3	18.58
Medfield/Hampden/Woodberry/Remington	75.44	10.53	10.09	3.95	73.11	8.96	11.32	6.6
Midtown	39.09	48.18	11.82	0.91	54.02	24.14	16.09	5.75
Midway/Coldstream	2.05	97.44	0	0.51	3.77	91.51	1.88	2.83
Morrell Park/Violetville	68.49	15.75	8.21	7.53	49.58	31.93	5.04	13.45
Mount Washington/Coldspring	66.67	13.04	13.04	7.25	67.65	16.18	8.82	7.35

CSA Neighborhood Names	2008				2018			
	Black NH	White NH	Other NH	Hisp. Any Race	Black NH	White NH	Other NH	Hisp. Any Race
North Baltimore/Guilford/Homeland	67.53	14.94	13.64	3.9	68.18	10.91	18.18	2.73
Northwood	7.04	88.44	1.01	3.52	6.72	89.92	1.68	1.68
Oldtown/Middle East	4.23	91.01	3.17	1.59	7.09	84.4	2.84	5.67
Orangeville/East Highlandtown	34.34	12.63	3.04	50	25.55	7.49	3.08	63.88
Patterson Park North & East	26.56	40	1.32	32.13	35.52	24.32	3.86	36.29
Penn North, Reservoir Hill	1.78	97.04	0.59	0.59	7.34	87.16	2.75	2.75
Pimlico/Arlington/Hilltop	1.61	95.16	1.08	2.15	1.79	94.64	0	3.57
Sandtown-Winchester/Harlem Park	2.1	96.15	1.05	0.7	3.74	95.19	0	1.07
South Baltimore	85.06	1.15	9.2	4.6	89.05	2.92	7.3	0.73
Southeastern	40.5	30.58	0.83	28.1	14.85	26.73	1.98	56.44
Southern Park Heights	3.2	95.02	1.07	0.71	4.73	91.89	0	3.38
Southwest Baltimore	13.58	80.74	0.74	4.94	8.41	80.37	3.74	7.48
The Waverlies	13.08	80.77	3.08	3.08	17.07	73.17	1.22	8.54
Upton/Druid Heights	2.74	94.98	0.92	1.37	2.76	95.17	0.69	1.38
Washington Village	46.81	48.94	4.25	0	25.76	53.03	13.64	7.58
Westport/Mt. Winans/Lakeland	16.36	61.21	0.61	21.82	9.68	37.1	1.62	51.61
Clifton, Berea	1.51	95.48	2.02	1.01	5.5	87.16	0	7.34
Dickeyville/Franklintown	10.53	87.72	1.75	0	12.28	78.95	3.51	5.26
Poppleton/The Terraces/Hollins Market	8.6	88.17	2.15	1.08	9.09	86.36	1.52	3.03

Source: Baltimore City Health Department

Note: NH is Non-Hispanic. AAPI is Asian-American/Pacific Islander. Other Race group comprises "unknown" or "other" and we derived it by subtracting identified groups from the total. Race/ethnicity counts protocols changed over time: Non-Hispanic White counts are available for all years; non-Hispanic Black, from 2010; non-Hispanic American Indian and AAPI, from 2015. These changes are reflected in gray shading, which denotes total counts disregarding ethnicity. Before 2015, Hispanic category overlapped with racial group counts.

Appendix Table 1.21. Number of Births by Age Group (19 to 39) and Race/Ethnicity, 2000-2020

	Ages 19 and Younger					Ages 20-24					Ages 25-39					Ages 30-34					Ages 35-39				
Year	W	B	O	H	T	W	B	O	H	T	W	B	O	H	T	W	B	O	H	T	W	B	O	H	T
2000	149	1,312	12	20	1,493	514	2,248	40	78	2,880	518	1,393	58	63	2,032	581	930	58	38	1,607	315	440	22	23	800
2001	138	1,198	17	29	1,382	461	2,079	48	90	2,678	488	1,309	71	64	1,932	535	850	53	28	1,466	315	463	30	29	837
2002	125	1,154	13	29	1,321	443	2,140	40	87	2,710	459	1,252	82	83	1,876	553	950	68	46	1,617	286	423	15	14	738
2003	122	983	7	36	1,148	479	2,075	49	114	2,717	502	1,368	59	109	2,038	565	881	77	47	1,570	323	460	39	22	844
2004						433	2,136	36	134	2,739	526	1,395	52	118	2,091	631	850	80	74	1,635	319	438	35	23	815
2005						447	2,157	32	157	2,793	493	1,379	74	149	2,095	608	775	84	79	1,546	355	468	27	34	884
2006	87	957	7	43	1,094	489	2,271	20	190	2,970	523	1,543	67	152	2,285	595	839	99	92	1,625	356	480	44	40	920
2007						427	2,289	25	188	2,929	560	1,607	53	172	2,392	641	871	109	112	1,733	349	429	46	49	873
2008	88	907	7	40	1,042	442	2,288	32	212	2,974	549	1,567	71	179	2,366	667	891	106	128	1,792	389	418	50	48	905
2009						414	2,068	37	171	2,690	562	1,541	66	196	2,365	692	891	115	118	1,816	384	404	54	55	897
2010						378	1,962	23	160	2,523	550	1,502	69	188	2,309	748	821	96	124	1,789	361	398	47	57	863
2011						350	1,915	38	167	2,470	610	1,439	73	225	2,347	779	904	87	148	1,918	376	396	39	59	870
2012						316	1,998	21	151	2,486	594	1,495	80	201	2,370	905	970	117	141	2,133	437	381	72	58	948
2013	31	405	6	25	467	309	1,835	34	151	2,329	578	1,454	105	193	2,330	850	963	127	150	2,090	436	415	54	92	997
2014	35	375	6	49	465	287	1,818	29	172	2,306	545	1,521	86	214	2,366	889	971	121	214	2,195	421	416	66	94	997
2015	39	317	8	63	427	281	1,686	31	167	2,165	563	1,541	77	218	2,399	865	992	129	218	2,204	404	427	66	84	981
2016						225	1,562	33	195	2,015	555	1,559	97	200	2,411	873	971	131	217	2,192	411	485	62	126	1,084
2017						240	1,332	35	173	1,780	463	1,434	71	181	2,149	804	1,000	126	220	2,150	465	444	61	127	1,097
2018	23	238	6	45	312	212	1,167	24	180	1,583	434	1,423	76	238	2,171	857	923	127	211	2,118	404	447	62	136	1,049
2019						206	1,081	23	209	1,519	458	1,379	58	227	2,122	805	1,026	115	251	2,197	441	501	48	143	1,133

Source: Baltimore City Health Department

Note: W is White, non-Hispanic; B is Black, non-Hispanic; O is Other, non-Hispanic; H is Hispanic, any race. T is total. Race/ethnicity counts protocols changed over time: Non-Hispanic White counts are available for all years; non-Hispanic Black, from 2010; non-Hispanic American Indian and AAPI, from 2015. Thus, before 2015, Hispanic category overlapped with some racial group counts. We omit births for those 40 years and older because the data are incomplete.

Appendix Table 1.22. Percent Baltimore City Babies born Full-Term, at or Above 5 Pounds, and with Care from the First Trimester, 2010 and 2019

CSA	% Full-Term		% Birthweight ≥ 5 LBS		% Care from First Trimester	
	2010	2019	2010	2019	2010	2019
Allendale/Irvington/S. Hilton	85.28	84.75	87.45	85.31	51.95	58.19
Beechfield/Ten Hills/West Hills	87.50	92.26	91.67	89.03	64.29	67.10
Belair-Edison	84.02	81.91	87.70	80.85	63.93	60.11
Brooklyn/Curtis Bay/Hawkins Point	83.15	83.69	89.89	89.27	50.94	51.50
Canton	94.59	92.25	94.59	95.35	73.87	85.27
Cedonia/Frankford	83.83	85.67	84.37	87.30	56.60	69.38
Cherry Hill	80.92	74.31	88.82	72.22	57.24	56.94
Chinquapin Park/Belvedere	87.04	88.37	92.59	87.21	63.89	65.12
Claremont/Armistead	83.02	89.87	83.02	89.24	47.17	62.66
Clifton-Berea	82.84	83.33	83.58	86.67	52.24	57.50
Cross-Country/Cheswolde	93.23	93.43	95.11	94.93	60.15	47.76
Dickeyville/Franklintown	85.45	89.66	85.45	91.38	63.64	60.34
Dorchester/Ashburton	87.22	83.51	85.71	83.51	56.39	73.20
Downtown/Seton Hill	87.50	91.38	80.36	91.38	69.64	74.14
Edmondson Village	85.05	81.58	85.05	84.21	62.62	53.95
Fells Point	94.16	94.50	94.16	94.50	59.09	79.82
Forest Park/Walbrook	85.92	86.26	87.32	85.50	52.82	54.96
Glen-Fallstaff	90.37	89.36	94.50	90.43	56.42	52.13
Greater Charles Village/Barclay	86.13	87.02	88.32	85.50	56.20	64.89
Greater Govans	87.23	82.52	87.94	85.44	60.99	60.19
Greater Mondawmin	78.42	91.95	85.61	89.66	49.64	65.52
Greater Roland Park/Poplar Hill	94.29	89.13	94.29	95.65	74.29	93.48
Greater Rosemont	87.11	82.50	87.80	86.00	52.26	56.50
Greenmount East	85.42	84.34	82.64	87.95	48.61	61.45
Hamilton	83.05	82.81	86.44	84.38	68.64	67.97
Harbor East/Little Italy	84.04	87.23	85.11	91.49	61.70	72.34
Harford/Echodale	85.84	88.42	88.05	86.84	57.96	66.32
Highlandtown	92.37	94.70	91.60	94.70	62.60	73.51
Howard Park/West Arlington	85.05	86.61	85.98	87.50	48.60	62.50
Inner Harbor/Federal Hill	92.68	90.57	92.07	92.45	74.39	84.91
Lauraville	85.83	86.36	86.61	87.88	66.14	71.21
Loch Raven	83.94	84.31	88.60	85.62	54.40	73.20
Madison/East End	83.63	81.55	85.38	80.58	50.29	44.66
Medfield/Hampden/Woodberry/Remington	90.00	90.83	91.00	90.37	66.50	80.73
Midtown	89.29	90.83	90.18	94.50	67.86	77.98
Midway/Coldstream	85.71	85.87	79.37	86.96	45.24	55.43
Morrell Park/Violetville	87.50	76.58	92.50	81.98	61.67	54.05

CSA	% Full-Term		% Birthweight ≥ 5 LBS		% Care from First Trimester	
	2010	2019	2010	2019	2010	2019
Mount Washington/Coldspring	89.55	91.07	92.54	91.07	64.18	76.79
North Baltimore/Guilford/Homeland	91.53	92.73	90.68	89.09	63.56	86.36
Northwood	85.89	88.10	84.05	88.10	58.28	70.63
Oldtown/Middle East	87.82	84.81	87.18	80.38	53.85	65.82
Orangeville/East Highlandtown	87.64	87.61	91.01	92.92	40.45	42.92
Patterson Park North & East	89.58	88.01	91.86	89.04	50.81	58.22
Penn North/Reservoir Hill	79.29	88.42	84.29	87.37	54.29	73.68
Pimlico/Arlington/Hilltop	83.44	85.71	84.71	85.71	50.96	53.57
Poppleton/The Terraces/Hollins Market	89.04	82.61	84.93	89.86	53.42	49.28
Sandtown-Winchester/Harlem Park	80.43	79.64	86.81	81.44	58.30	61.08
South Baltimore	97.09	93.44	95.15	94.26	71.84	85.25
Southeastern	83.02	87.59	83.02	86.86	50.94	56.20
Southern Park Heights	85.38	84.52	87.74	79.76	52.36	55.95
Southwest Baltimore	85.76	85.32	87.03	82.11	50.00	55.50
The Waverlies	82.05	91.58	83.76	93.68	55.56	62.11
Upton/Druid Heights	88.30	92.13	88.30	90.55	60.82	59.84
Washington Village/Pigtown	84.85	91.94	92.93	96.77	65.66	69.35
Westport/Mount Winans/Lakeland	86.78	83.90	92.56	88.98	47.11	50.85

Source: Baltimore Neighborhood Indicators Alliance

Appendix Table 1.23. Proportion of Mothers Using WIC for Babies born in Baltimore City, 2010—2019

Year	Using WIC	Total	% Using WIC
2010	5,440	8,722	62.4%
2011	5,562	8,735	63.7%
2012	5,586	8,958	62.4%
2013	5,339	8,675	61.5%
2014	5,210	8,731	59.7%
2015	5,110	8,543	59.8%
2016	4,773	8,412	56.7%
2017	4,306	7,841	54.9%
2018	4,029	7,592	53.1%
2019	3,989	7,626	52.3%

Source: Baltimore City Health Department

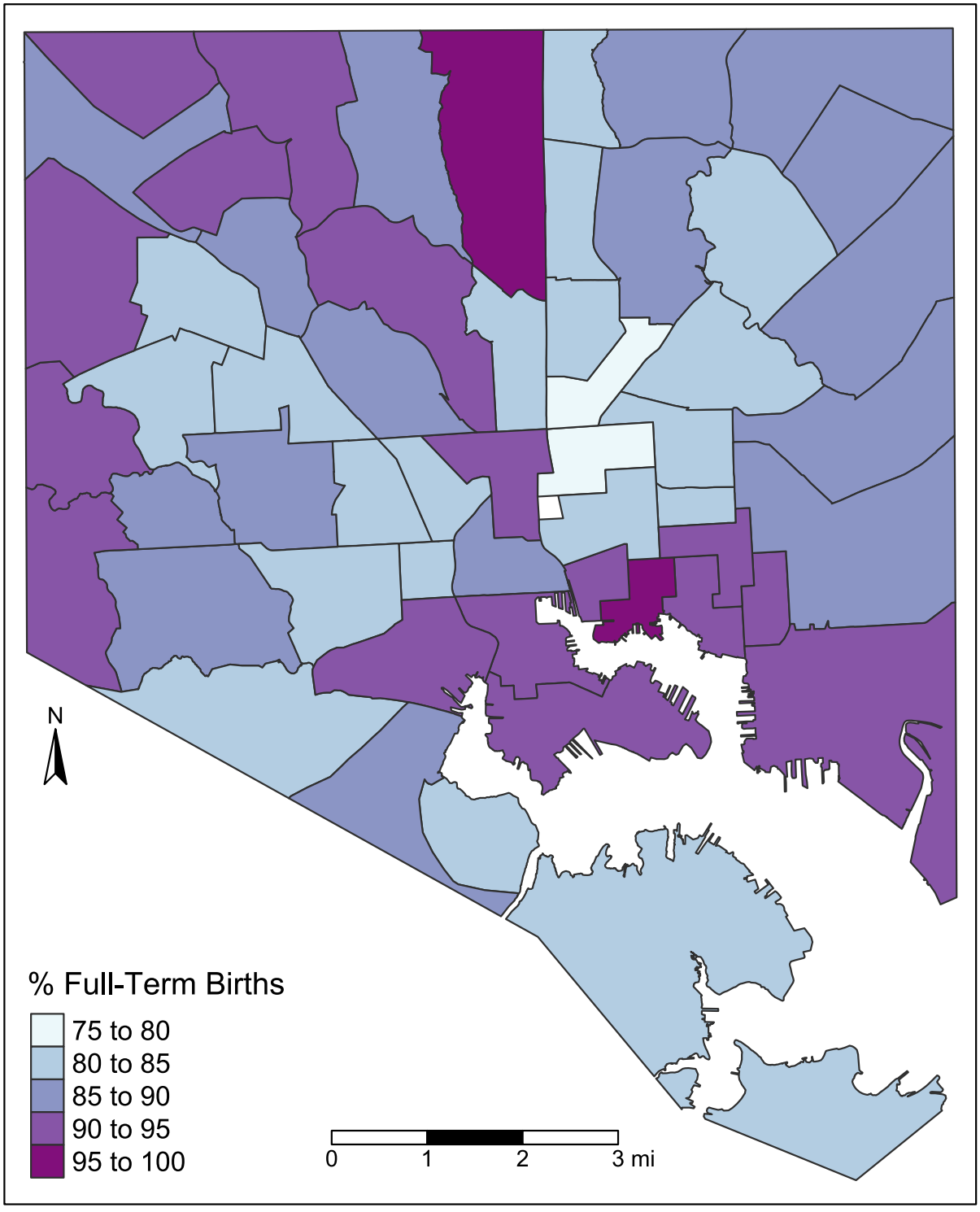
Appendix Table 1.24. Number and Proportion of Baltimore City Pregnant Women with Hypertension (Chronic, Gestational, and/or Eclampsia), 2000–2019

Year	Number of Pregnant Women with Hypertension	Percent of Pregnant Women with Hypertension
2000	397	4.11
2001	388	4.26
2002	457	5.05
2003	445	4.91
2004	490	5.33
2005	523	5.7
2006	456	4.67
2007	432	4.37
2008	511	5.15
2009	497	5.23
2010	707	7.9
2011	707	7.96
2012	667	7.32
2013	883	10.01
2014	1,001	11.29
2015	1,096	12.65
2016	1,176	13.79
2017	1,186	14.94
2018	1,078	14.04
2019	1,169	15.14

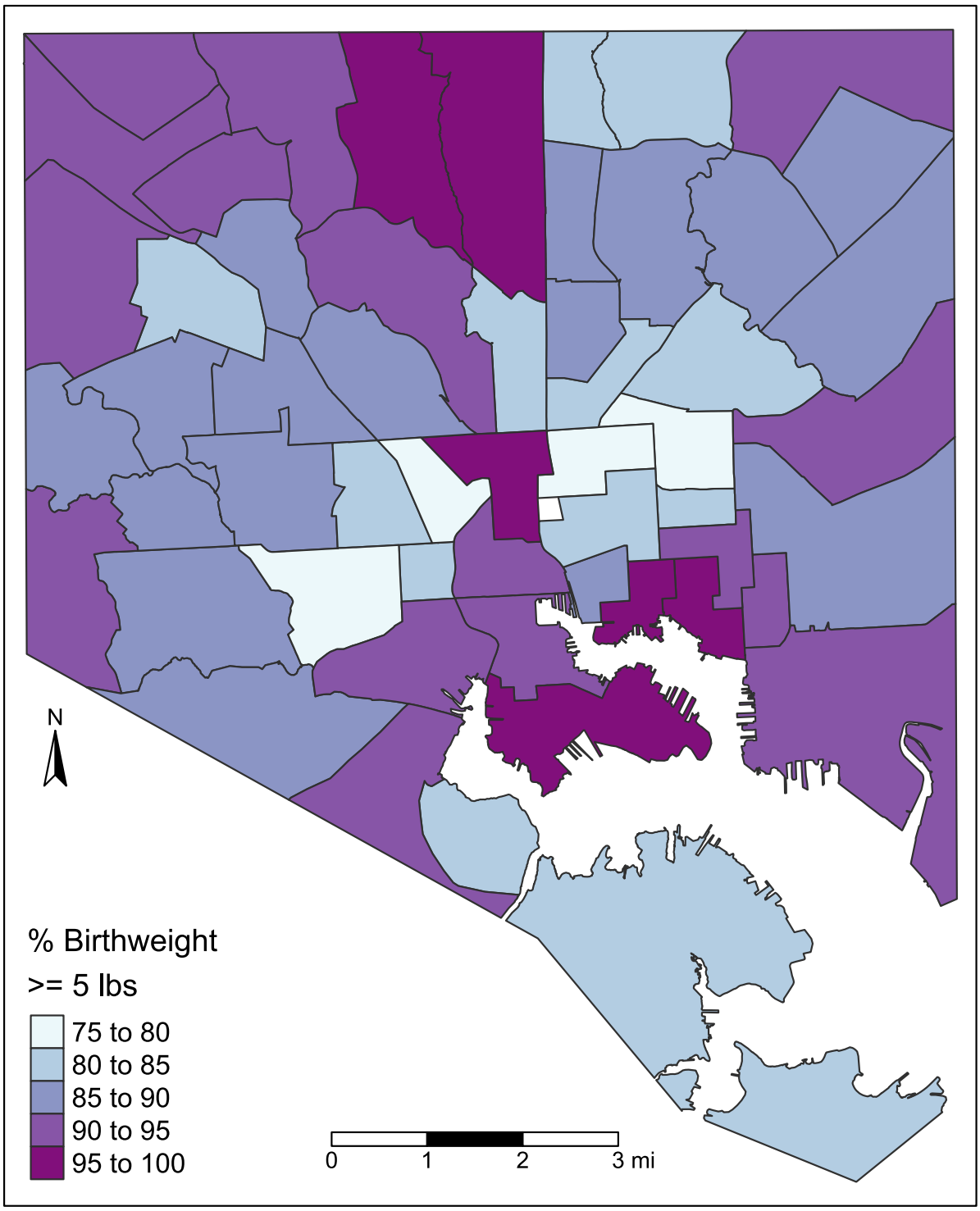
Source: Baltimore City Health Department

Note. These data comprise chronic, gestational,and/or eclampsia hypertension types.

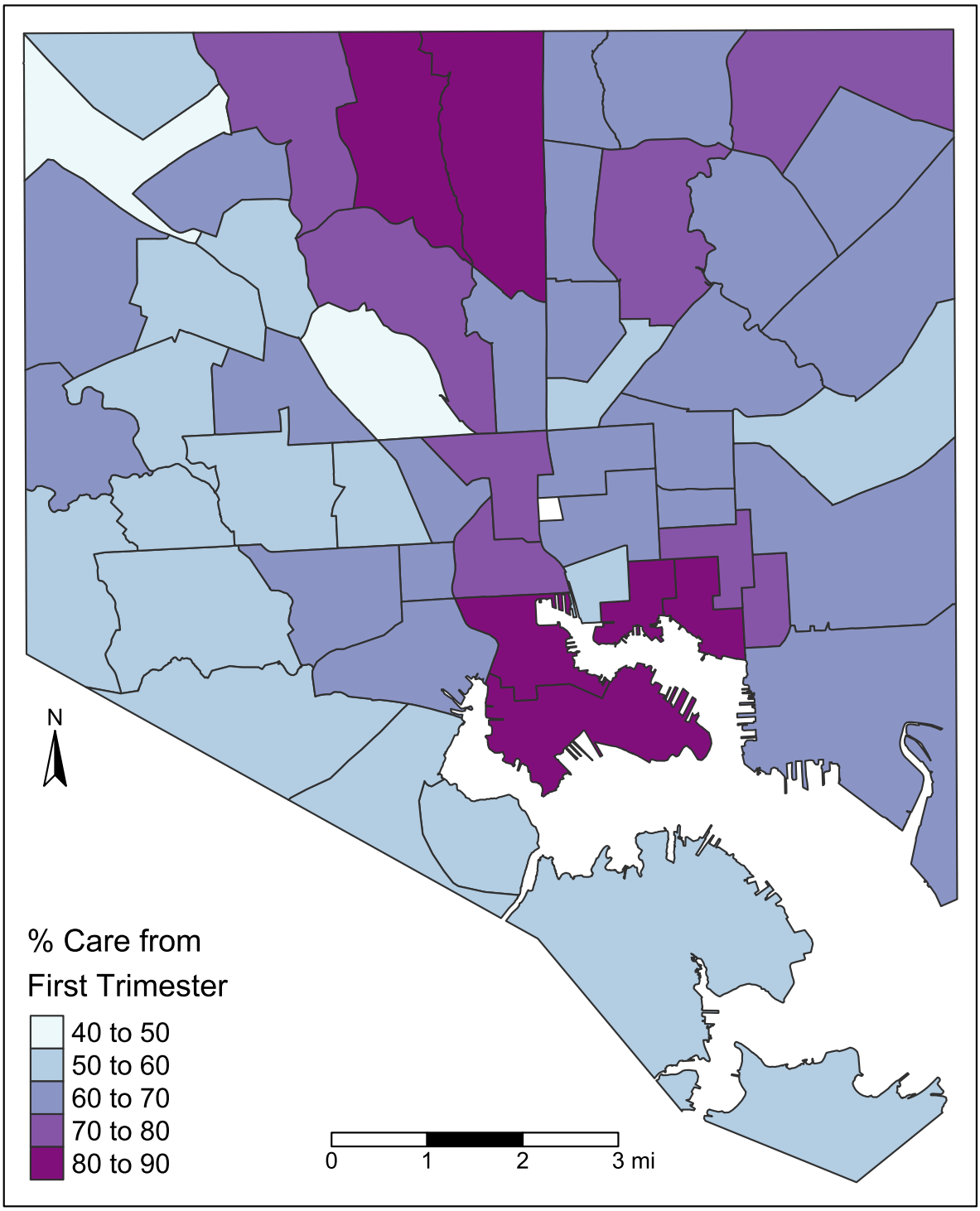
Appendix Figure 1.41. Percent of Baltimore City Babies Born Full-Term by CSA, 2018



Appendix Figure 1.42. Percent of Baltimore City Babies Born at or Above 5 Pounds by CSA, 2018



Appendix Figure 1.43. Percent of Baltimore City Birthing Parents Receiving Care from the First Trimester by CSA, 2018

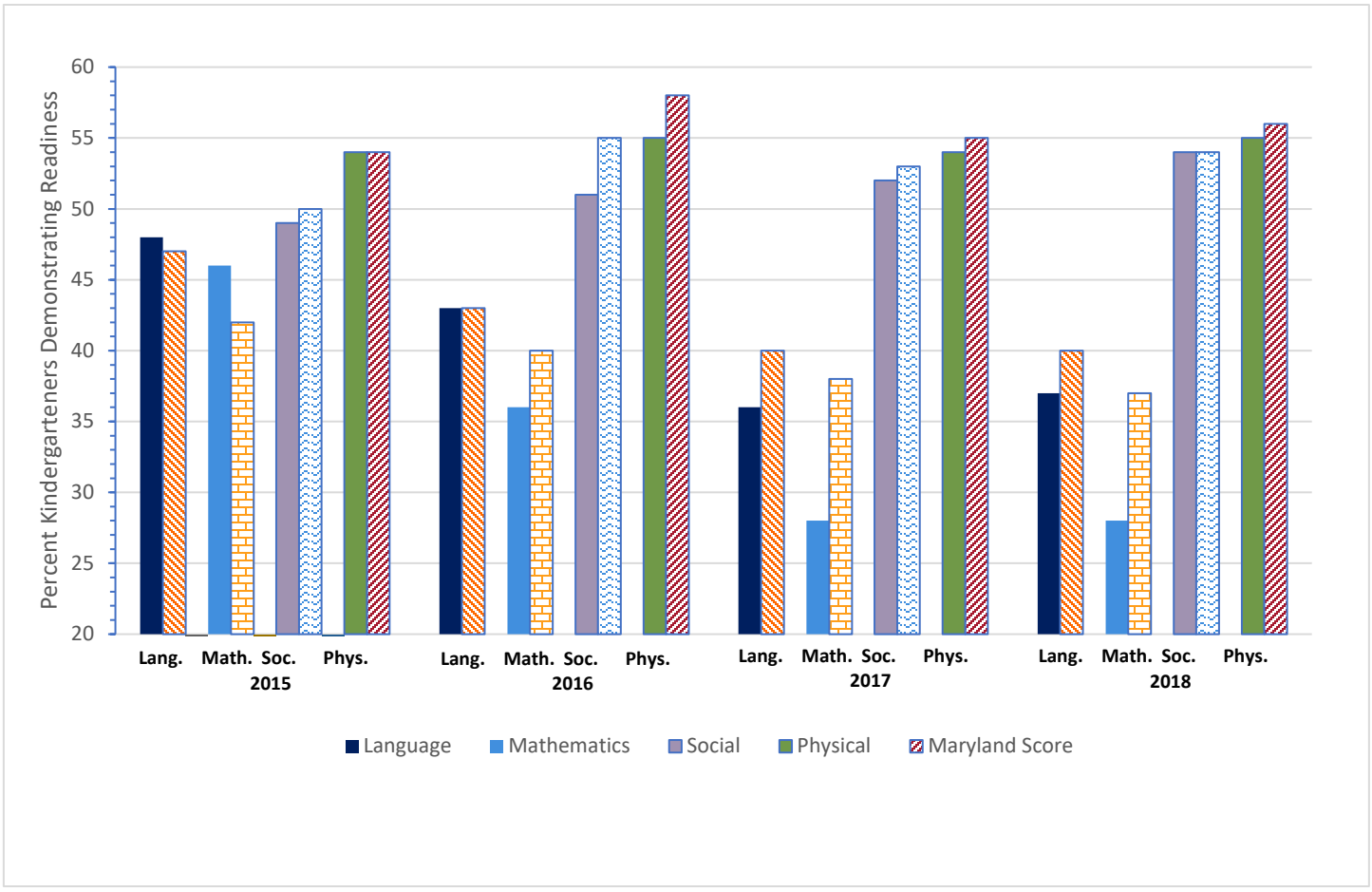


CHAPTER 2.

Appendix Table 2.1. Kindergarten Chronic Absenteeism, 1999-2019

Academic Year	# of students chronically absent	# of total students	% chronically absent
1999–2000	2,258	7,645	29.54%
2000–2001	2,229	6,961	32.02%
2001–2002	1,894	6,688	28.32%
2002–2003	2,051	6,664	30.78%
2003–2004	1,749	6,576	26.60%
2004–2005	1,648	6,261	26.32%
2005–2006	1,734	6,349	27.31%
2006–2007	1,661	6,240	26.62%
2007–2008	1,606	6,612	24.29%
2008–2009	1,536	6,709	22.89%
2009–2010	1,836	6,748	27.21%
2010–2011	2,134	7,143	29.88%
2011–2012	1,822	7,395	24.64%
2012–2013	2,135	7,619	28.02%
2013–2014	2,250	7,733	29.10%
2014–2015	2,425	7,669	31.62%
2015–2016	1,988	7,051	28.19%
2016–2017	2,212	6,890	32.10%
2017–2018	2,356	6,567	35.88%
2018–2019	2,503	6,563	38.14%

Appendix Figure 2.1. Baltimore City and Maryland Kindergartners Demonstrating Readiness by Domain, 2015-2018



CHAPTER 3.

Appendix Table 3.1. Characteristics of Children and Families Enrolled in Each ECDC Program

	M&I (n=212)		BITP (n=886)		EHS (n=127)		HS (n=1,711)		PreK (N=3,337)	
	N	%	N	%	N	%	N	%	N	%
From Vital Statistics Data:										
Mothers' race/ethnicity[a]										
Hispanic/Latina	*	*	45	5.1	*	*	113	6.6	214	6.4
Black, non-Hispanic	192	90.6	738	83.3	121	95.3	1511	88.3	2858	85.7
Mothers' education attainment at birth										
Less than High School	104	49.3	320	36.4	35	27.6	581	34.0	1110	33.4
High School Graduate	82	38.9	391	44.4	57	44.9	780	45.7	1457	43.9
More than High School	25	11.9	169	19.2	35	27.6	346	20.3	755	22.7
Received medical assistance at birth	180	84.9	660	74.5	103	81.1	1344	78.6	2410	72.2
Teen mother at birth (19 years or younger)	59	27.8	184	20.8	32	25.2	416	24.3	748	22.4
Baby preterm at birth	59	27.8	268	30.3	20	15.8	242	14.2	438	13.2
Low birth weight	48	22.6	256	28.9	25	19.7	216	12.6	422	12.7
***From Baltimore City Public Schools Data*:**										
Received ELL services	*	*	*	*	*	*	118	5.7	216	5.1
Received Special Education	38	17.0	252	28.4	17	12.0	220	10.7	362	8.6
Child female	109	48.9	348	39.3	64	45.1	1018	49.5	2099	50.0
Child male	114	51.1	538	60.7	78	54.9	1040	50.5	2101	50.0
From Census Tract Data:										
20% poverty	154	75.1	666	76.8	87	70.7	1292	77.3	2389	72.9
40% poverty	57	27.8	323	37.3	42	34.2	655	39.2	1164	35.5

*Suppressed to protect study privacy.

Appendix Table 3.2. Cross-Enrollment Between ECDC Programs

	n	%
Head Start Participants	2058	-
Born in Baltimore	1711	83.1%
Participated in:		
M&I	74	3.6%
BITP	306	14.9%
EHS	115	5.6%
PreK	1025	49.8%
Only enrolled in HS	814	39.6%

	n	%
PreK Participants	4200	-
Born in Baltimore	3337	79.5%
Participated in:		
M&I	137	3.3%
BITP	483	11.5%
EHS	88	2.1%
HS	1025	24.4%
Only enrolled in PreK	2739	65.2%

	n	%
BITP Participants	886	
Born in Baltimore	886	100.0%
Participated in:		
M&I	71	8.0%
EHS	40	4.5%
HS	306	34.5%
PreK	484	54.6%
Only enrolled in BITP	216	24.4%

	n	%
EHS Participants	142	
Born in Baltimore	127	89.4%
Participated in:		
M&I	8	5.6%
BITP	40	28.2%
HS	115	81.0%
PreK	88	62.0%
Only enrolled in EHS	5	3.5%

Note. Children may be enrolled in multiple programs.

Appendix Table 3.3. EC Experiences and Attendance Using the Medical Assistance and Neighborhood Poverty Status

		Medical Assistance at Birth					**Concentrated Poverty in Neighborhood (20% poverty rate)**				
		Low CA	High CA	Increasing CA	*Decreasing CA*	*Total*	*Low CA*	*High CA*	*Increasing CA*	*Decreasing CA*	*Total*
No ECDC programming	n	362	174	104	83	723	405	146	96	72	719
	%	50.07	24.07	14.38	11.48	100	56.33	20.31	13.35	10.01	100
At least one ECDC programming	n	1829	585	523	325	3262	1923	501	509	295	3228
	%	56.07	17.93	16.03	9.96	100	59.57	15.52	15.77	9.14	100
No HS or PreK	n	445	230	133	105	913	501	196	126	94	917
	%	48.74	25.19	14.57	11.5	100	54.63	21.37	13.74	10.25	100
Only HS	n	388	100	111	63	662	394	85	107	55	641
	%	58.61	15.11	16.77	9.52	100	61.47	13.26	16.69	8.58	100
Only PreK	n	951	332	274	171	1728	1023	286	270	159	1738
	%	55.03	19.21	15.86	9.9	100	58.86	16.46	15.54	9.15	100
HS & PreK	n	407	97	109	69	682	410	80	102	59	651
	%	59.68	14.22	15.98	10.12	100	62.98	12.29	15.67	9.06	100

CA = Chronic Absenteeism

Appendix Table 3.4. EC Experiences and Attendance Using the Subsample of Teen Mothers

		Born to Teen Mothers				
		Low CA	High CA	Increasing CA	Decreasing CA	Total
No ECDC programming	n	116	62	42	40	260
	%	44.62	23.85	16.15	15.38	100
At least one ECDC programming	n	524	215	163	133	1035
	%	50.63	20.77	15.75	12.85	100
No HS or PreK	n	147	83	48	45	323
	%	45.51	25.7	14.86	13.93	100
Only HS	n	120	39	38	27	224
	%	53.57	17.41	16.96	12.05	100
Only PreK	n	273	120	86	77	556
	%	49.1	21.58	15.47	13.85	100
HS & PreK	n	100	35	33	24	192
	%	52.08	18.23	17.19	12.5	100

CA= Chronic Absenteeism

Appendix Table 3.5. Proportion Demonstrating Readiness by ECDC, HS, and PreK Enrollment

		Medical Assistance at Birth					Concentrated Poverty In Neighborhood (20% poverty rate)					Teen				
		Comp	Language	Math	Social	Phys	Comp	Language	Math	Social	Phys	Comp	Language	Math	Social	Phys
No ECDC programming	n	187	178	179	222	253	213	220	210	246	267	59	61	63	72	78
	%	30.31	29.72	29.54	36.69	41.82	33.39	35.31	33.39	39.11	42.52	28.5	30.35	31.19	35.64	38.61
At least one ECDC programming	n	1472	1481	1389	1524	1676	1435	1419	1375	1470	1650	431	425	400	438	479
	%	47.99	49.75	46.36	50.99	56.07	47.41	48.41	46.58	50.02	56.05	48.92	49.65	46.46	50.99	55.63
No HS or PreK	n	222	214	218	266	297	251	265	251	292	316	67	69	72	82	90
	%	28.5	28.65	28.72	35.14	39.23	31.14	34.28	32.02	37.39	40.36	27.13	28.87	30	34.02	37.34
Only HS	n	213	217	194	243	277	197	196	179	227	264	65	70	57	76	80
	%	34.52	35.99	31.96	40.03	45.63	33.39	33.91	30.86	39	45.28	37.79	41.92	33.93	44.97	47.06
Only PreK	n	821	818	770	843	922	820	794	785	824	925	246	232	222	239	268
	%	52.03	53.08	49.74	54.63	59.75	51.9	51.56	50.68	53.54	60.06	53.25	51.67	49.01	53.23	59.42
HS & PreK	n	403	410	386	394	433	380	384	370	373	412	112	115	112	113	119
	%	56.76	59.85	56.1	57.35	63.03	55.15	57.92	55.39	56.01	61.86	54.11	56.93	55.45	55.94	59.2

Comp = Composite Score

Appendix Table 4.1. Kindergarten Enrollment Projection

Birth Year	School Year	Actual Births	Birth Forecast (0.7% decrease yearly)	Actual City Schools PreK Enrollment	Actual City Schools K Enrollment	Enrollment Forecast (75% historical high)	Enrollment Forecast (60% historical low)	Enrollment Forecast (69% historical average)
1996	2002	9752	-	3280	6192	7314	5851	6729
1997	2003	9262	-	3240	5956	6947	5557	6391
1998	2004	9624	-	3379	5729	7218	5774	6641
1999	2005	9734	-	3232	5884	7301	5840	6716
2000	2006	9641	-	3414	5797	7231	5785	6652
2001	2007	9100	-	3642	6124	6825	5460	6279
2002	2008	9046	-	3999	6353	6785	5428	6242
2003	2009	9057	-	4712	6420	6793	5434	6249
2004	2010	9183	-	4874	6722	6887	5510	6336
2005	2011	9179	-	4852	7064	6884	5507	6334
2006	2012	9757	-	4890	7271	7318	5854	6732
2007	2013	9875	-	4763	7349	7406	5925	6814
2008	2014	9911	-	4811	7304	7433	5947	6839
2009	2015	9504	-	4691	6729	7128	5702	6558
2010	2016	8945	-	4488	6549	6709	5367	6172
2011	2017	8878	-	4411	6207	6659	5327	6126
2012	2018	9108	-	4337	6203	6831	5465	6285
2013	2019	8812	-	4394	5980	6609	5287	6080
2014	2020	8863	-	2816	5635	6647	5318	6115
2015	2021	8658	-		-	6494	5195	5974
2016	2022	8526	-		-	6395	5116	5883
2017	2023	7936	-		-	5952	4762	5476
2018	2024	7680	-		-	5760	4608	5299
2019	2025	7720	-		-	5790	4632	5327
2020	2026	-	7727		-	5795	4636	5331
2021	2027	-	7660		-	5745	4596	5285
2022	2028	-	7593		-	5695	4556	5239
2023	2029	-	7526		-	5645	4516	5193
2024	2030	-	7460		-	5595	4476	5147
2025	2031	-	7393		-	5545	4436	5101
2026	2032	-	7326		-	5494	4396	5055
2027	2033	-	7259		-	5444	4356	5009
2028	2034	-	7192		-	5394	4315	4963
2029	2035	-	7126		-	5344	4275	4917
2030	2036	-	7059		-	5294	4235	4871