

## Chapter 5: Maternal and Child Health



## Maternal and Child Health

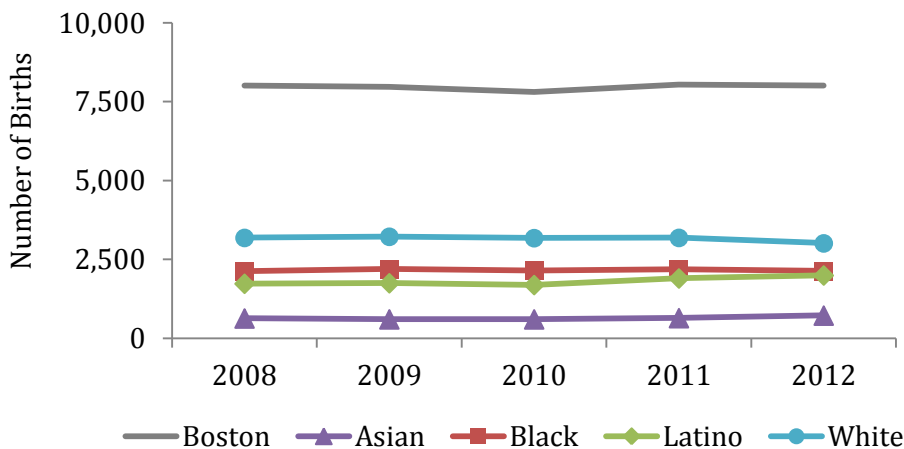
Birth rates, infant mortality rates (IMR), and infant characteristics of birth weight and gestational age provide important measures for the well-being of infants and pregnant women, and are often viewed as a reflection of the health status of a community. The IMR in particular is a key marker of maternal and child health, and serves as an important gauge for social and economic progress as well as the effectiveness of healthcare systems (1). Infant mortality is defined as the death of an infant before his or her first birthday. In the United States, substantial progress has been made throughout the 20<sup>th</sup> century in reducing the rate of infant mortality. Despite the progress, the IMR for the United States—one of the wealthiest countries in the world—is relatively high and above the 34 country-average for the Organization for Economic Cooperation and Development (1). Significant differences persist among racial and ethnic groups in the United States where Black infants continue to die at nearly twice the rate of non-Latino White infants (2). The majority of infant deaths in the United States occur from birth defects, being born too small or too soon, maternal pregnancy complications, injury to the child, or sudden infant death syndrome (3).

Low birth weight (birth weight less than 5 pounds, 8 ounces or 2,500 grams) and preterm birth (gestational age less than 37 weeks of completed pregnancy) are important predictors of infant survival. Preterm and low birth weight infants are at higher risk of early death and long-term health and developmental issues than infants born later in pregnancy and at a higher birth weight. In 2009, 35% of all infant deaths were related to preterm birth (4). Decreases in the percentage of preterm births and low birth weight births occurred nationwide from 2006 to 2011; however, substantial inequities persist between different racial and ethnic groups. In 2011, Black women were twice as likely to have a low birth weight infant (13.3 percent compared with 7.1 percent for White women) and 1.6 times more likely to have a preterm birth (16.8 compared with 10.5 percent) (5).

Rates of low birth weight (LBW), preterm births, and infant mortality are influenced by a variety of individual, socioeconomic, and environmental factors that impact children and families throughout their lives. Individual factors include the health status of the mother (e.g., diabetes, high blood pressure or nutritional status), and maternal health behaviors, such as smoking during pregnancy (6). Socioeconomic and environmental influences include low socioeconomic status, limited access to medical care, and residence in disadvantaged neighborhoods, all of which may contribute to maternal stress (7).

A number of studies indicate that the cumulative effect of chronic stressors endured by women over time may play a major role in adverse outcomes for mothers and their infants (8, 9). These stressors include, but are not limited to, domestic violence, racism, living in neighborhoods with poor housing and inadequate access to health resources and services. For example, women who are exposed to the chronic stress of racism may experience physiological changes in their body that are detrimental to their health and the healthy development of their fetus (9, 10).

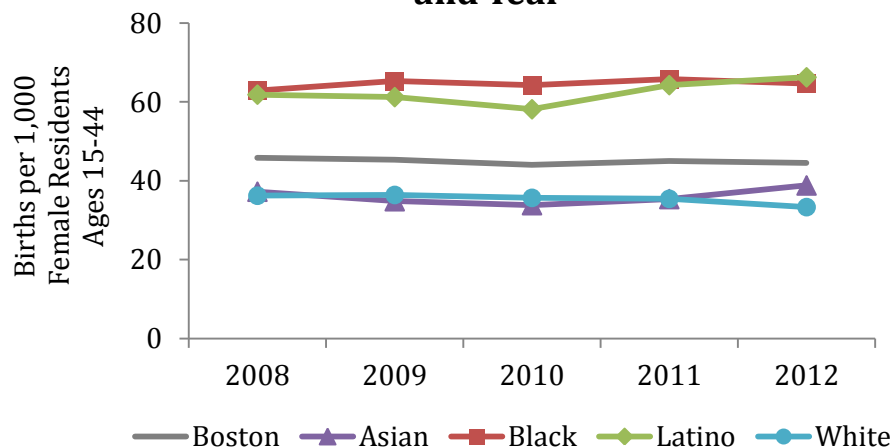
Hormonal changes that occur with persistent stressors during pregnancy can interfere with normal brain development, while parenting stress and environmental stressors are risk factors for childhood maltreatment and increased risk of health and social problems for children later in life (10,11, 12).

**Figure 5.1 Birth Count by Race/Ethnicity and Year**

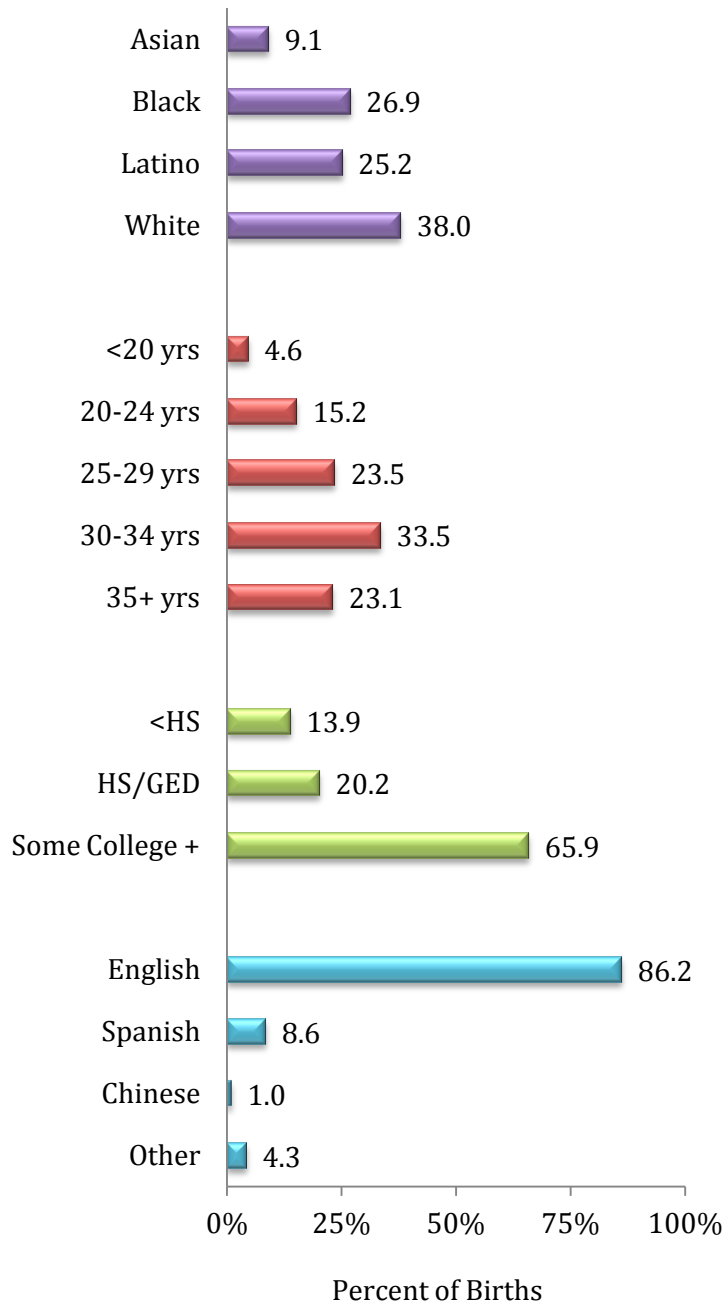
In Boston in 2012, there were 8,011 births. Of the births with reported race/ethnicity, 726 were to Asian women, 2,136 to Black women, 1,998 to Latino women and 3,016 to White women.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

In 2012, there were 44.5 births per 1,000 female Boston residents, ages 15-44. There was no significant change in the Boston birth rate between 2008 and 2012. There was an increase in the birth rate among Latino women and a decrease in the birth rate among White women from 2008 to 2012. In 2012, the rate of births to Black (64.7), Latino (66.3) and Asian (38.8) women was higher compared to White women (33.3).

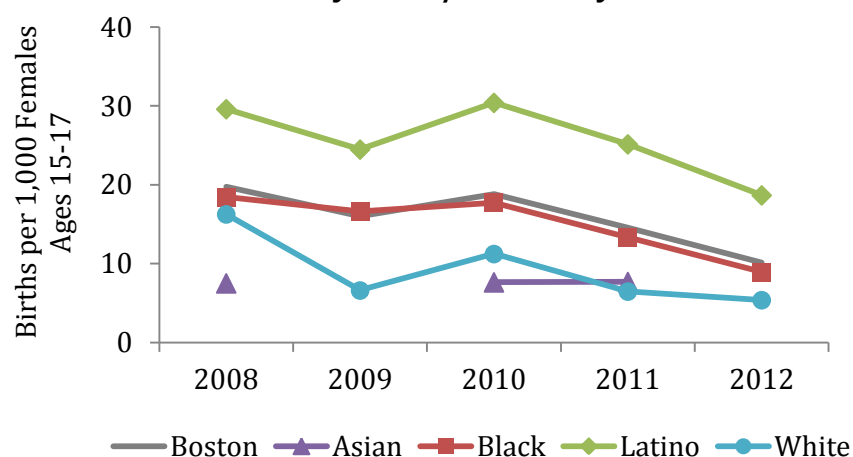
**Figure 5.2 Birth Rate by Race/Ethnicity and Year**

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

**Figure 5.3 Births by Selected Indicators, 2012**

In 2012, 38% of births were to White woman and 61% were to women of color. Fifty-seven percent of births were to women 30 years of age and over, and 66% of women who gave birth had a least some college education. Eighty-six percent of births were to women whose preferred spoken language was English.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

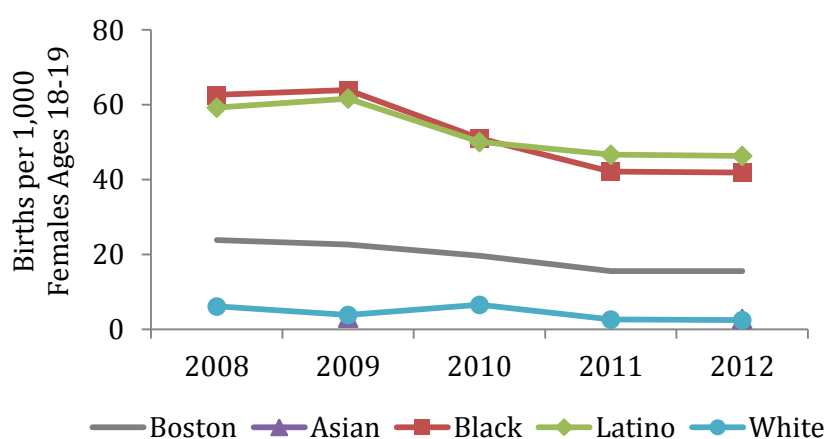
**Figure 5.4 Births Among Females Ages 15-17 by Race/Ethnicity and Year**

NOTES: Rates for Asian residents for the years 2008, 2010 and 2011, and for White residents for the years 2009-2012 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents for 2009 and 2012 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

The birth rate among Boston female adolescents ages 15 to 17 years decreased from 19.7 births per 1,000 females 15-17 years of age in 2008 to 10.1 in 2012. A decrease in the birth rate from 2008 to 2012 was also observed among Black, Latino, and White adolescents. In 2012, the birth rate among Latino females 15-17 years of age was higher than that of White females.

From 2008 to 2012 the birth rate for Boston females ages 18 to 19 years decreased. The birth rate also decreased among Black, Latino and White females ages 18 to 19 years during the same time period. Black females had a birth rate of 41.9 births per 1,000 females ages 18 to 19 years and Latino females had a birth rate of 46.3 in 2012. These rates were higher than the rate of births to White residents (2.5) in 2012.

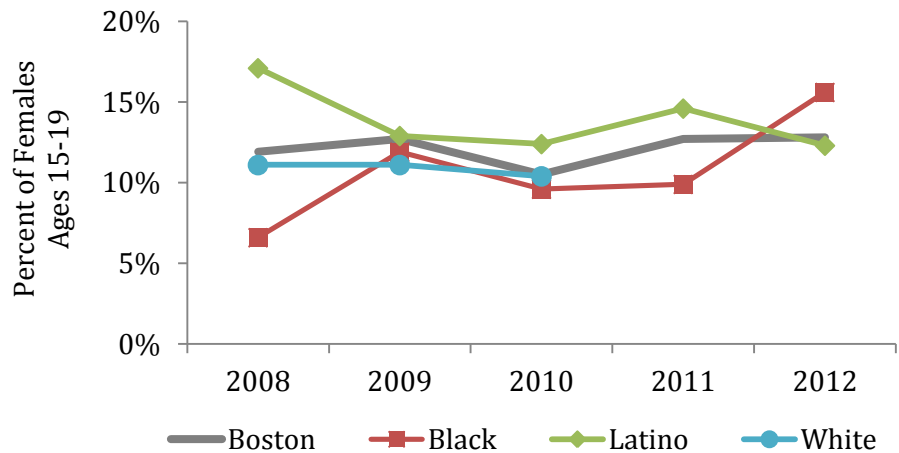
**Figure 5.5 Births Among Females Ages 18-19 by Race/Ethnicity and Year**

NOTES: Rates for Asian residents for the years 2009 and 2012 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents in 2008, 2010 or 2011 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

Of the Boston females ages 15-19 who gave birth in 2012, 13% had given birth previously. There was no significant change in the percentage of teens with repeat births from 2008 to 2012. In 2012, the percentage of Black females ages 15-19 who had given birth previously was 16% and the percentage of Latino females who had given birth previously was 12%.

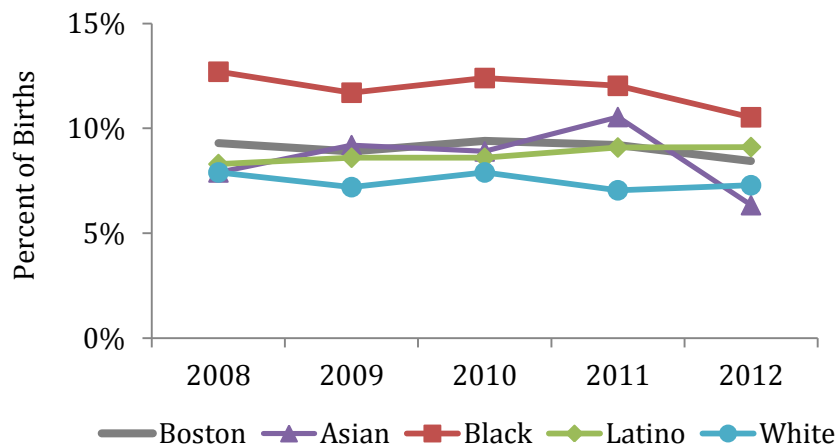
**Figure 5.6 Repeat Adolescent Ages 15-19 Years Births by Race/Ethnicity and Year**



NOTES: Rates for Black residents for the years 2008, 2010, and 2011, and White residents for 2008-2010 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents from 2008-2012 and for White residents in 2011 and 2012 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

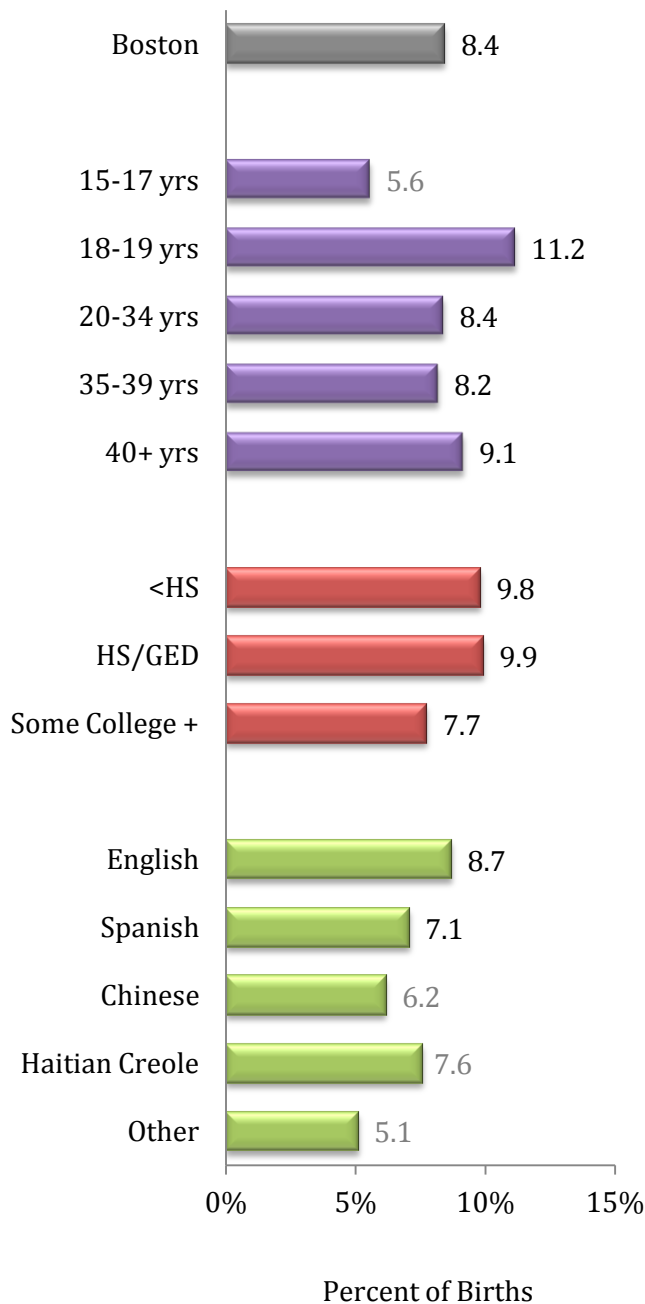
**Figure 5.7 Low Birthweight Births by Race/Ethnicity and Year**



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

From 2008 to 2012, the percentage of low birthweight births did not significantly change. There was also no significant change in the percentage of low birthweight births to Asian, Black, Latino or White women from 2008 to 2012. In 2012, Black and Latino women gave birth to higher percentages of low birthweight babies, 11% and 9% respectively, than White women, 7%. The percentage for Asian women (6%) was similar to that of White women.

**Figure 5.8 Low Birthweight Births by Selected Indicators, 2012**



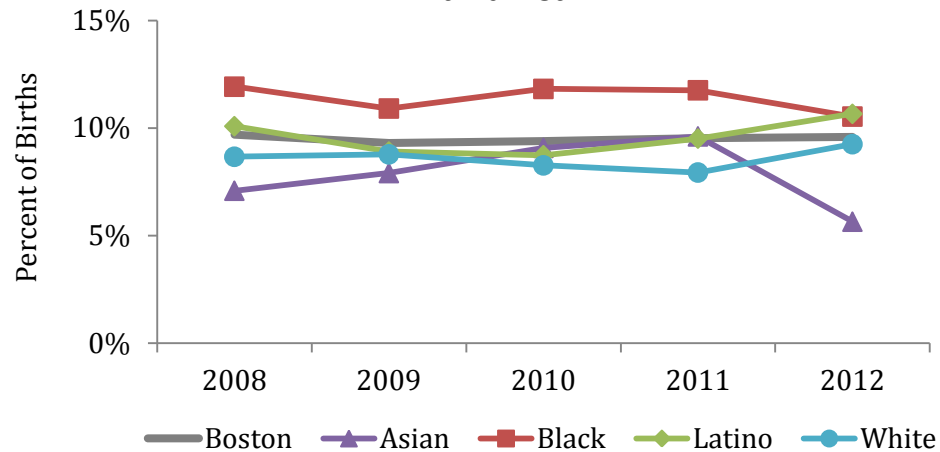
In 2012, a higher percentage of low birthweight births occurred to women with less than a high school diploma and those with a high school diploma or GED compared to those with at least some college. The percentages of low birthweight births among women whose preferred spoken language was not English were similar to that of mothers who preferred language was English. The percentages of low birthweight births were similar across all age groups.

NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

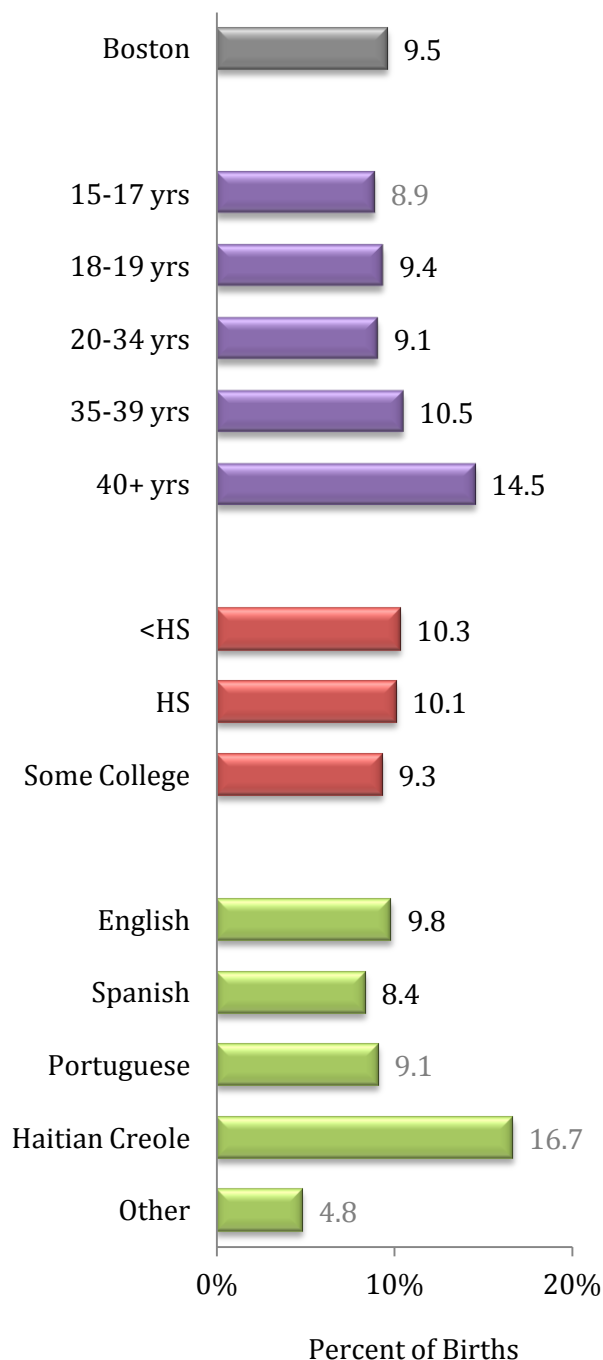


**Figure 5.9 Preterm Births by Race/Ethnicity and Year**



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

In 2012, 9.6% of births were preterm. There was no significant change in the percentage of preterm births to Boston women from 2008-2012. This was also true for all racial/ethnic groups during the same time period. In 2012, the percentage of preterm births among Asian women (6%) was lower compared to White women (9%). The percentages of preterm births to Black (11%) and Latino (11%) women were similar to that of White women in 2012.

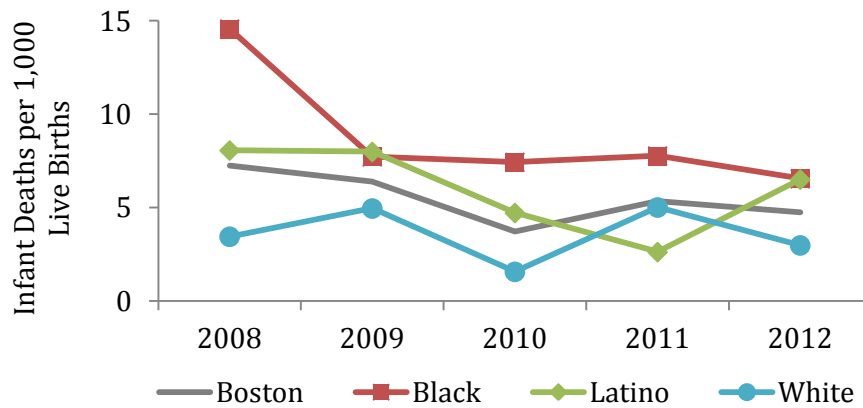
**Figure 5.10 Preterm Births by Selected Indicators, 2012**

In 2012, there was a higher percentage of preterm births among women ages 40 years and over compared to women ages of 20-34. The percentages of preterm births by education level of the mother were similar. A lower percentage of preterm births occurred to women whose preferred spoken language was Other compared to women whose preferred spoken language was English.

NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

**Figure 5.11 Infant Deaths by Race/Ethnicity and Year**



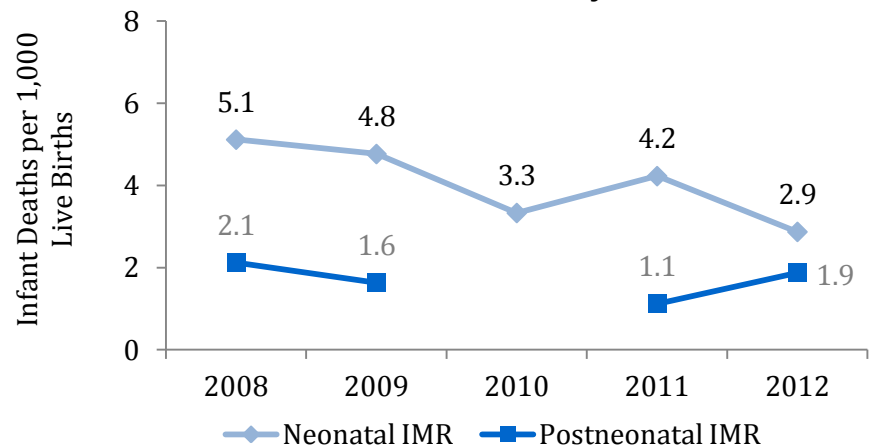
NOTES: Rates for Black infants for the years 2011 and 2012, Latino infants from 2008-2012 and White infants from 2008-2012 were based on counts less than 20 and should be interpreted with caution. Infant death rates for Asian infants were not presented due to the small number of cases.

DATA SOURCE: Boston resident live births and deaths, Massachusetts Department of Public Health

From 2008 to 2012 there was a significant decrease in the Boston and the Black infant death rate. There was no change over time in the Latino or White infant death rate. In 2012, the rates for Black infant deaths (6.6 infants per 1,000 live births) and Latino infant deaths (6.5) were similar compared to White infant deaths (3.3).

In 2012, there were 2.9 neonatal infant deaths (deaths within the first 28 days of life) per 1,000 live births in Boston. From 2008-2012, there was a significant decrease in the rate of neonatal infant deaths. In 2012, there were 1.9 postneonatal infant deaths (deaths between 28 days up to 1 year after birth) per 1,000 live births in Boston.

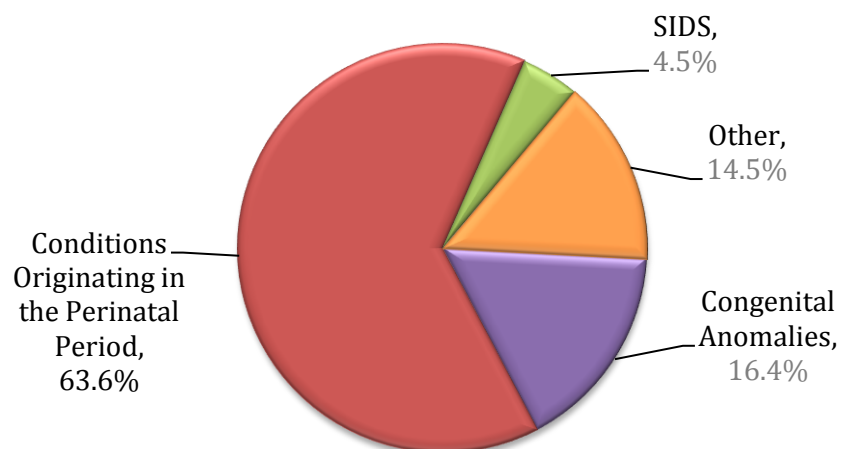
**Figure 5.12 Neonatal and Postneonatal Infant Deaths by Year**



NOTES: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20. Postneonatal infant death rates for 2010 were not presented due to the small number of cases.

DATA SOURCE: Boston resident live births and deaths, Massachusetts Department of Public Health

**Figure 5.13 Infant Deaths by Cause of Death, 2010-2012 Combined**

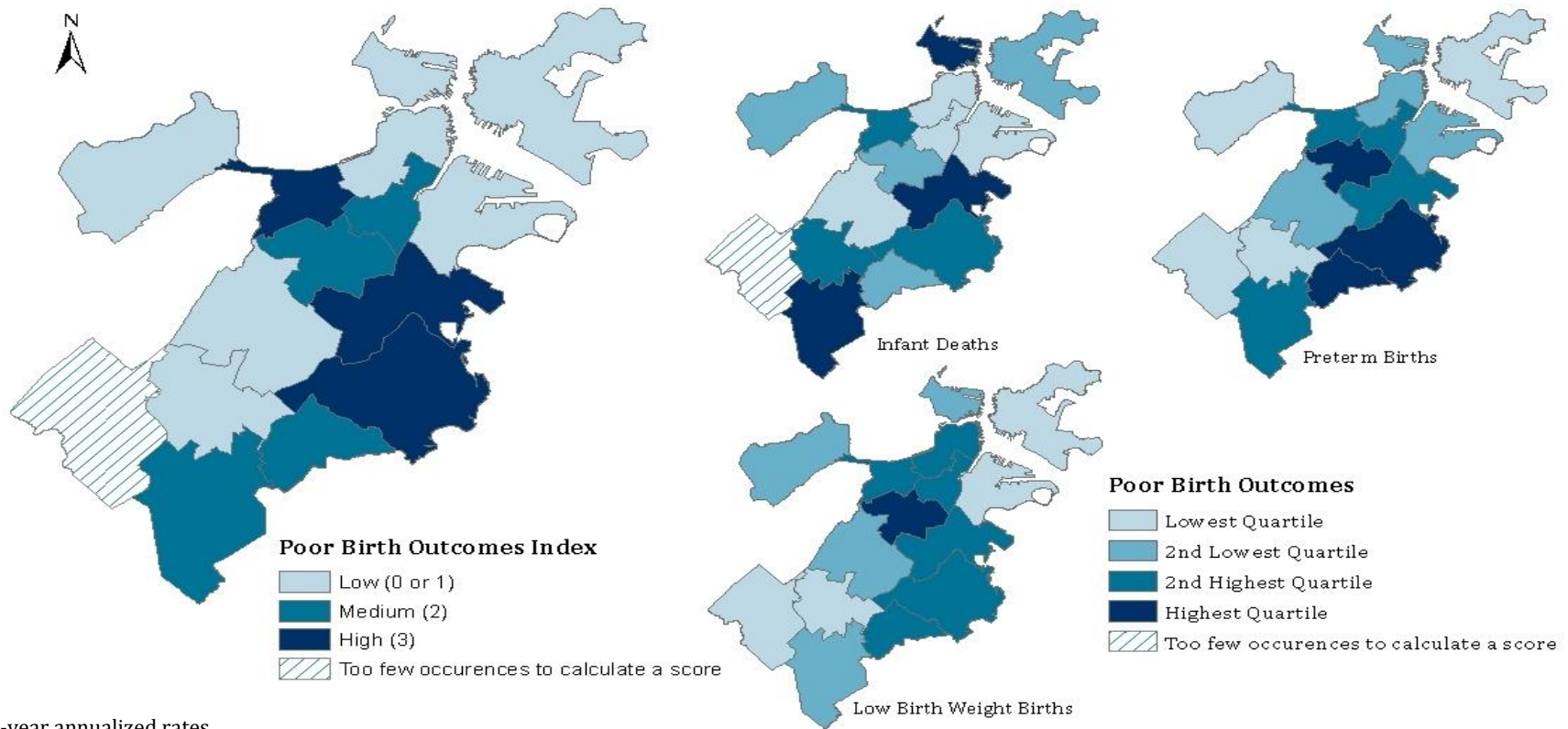


NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

For 2010 to 2012 combined, 64% of infant deaths among Boston residents were caused by conditions originating in the perinatal period and 16% of these deaths were a result of congenital anomalies.

**Figure 5.14 Birth Outcomes by Neighborhood, 2008-2012\***



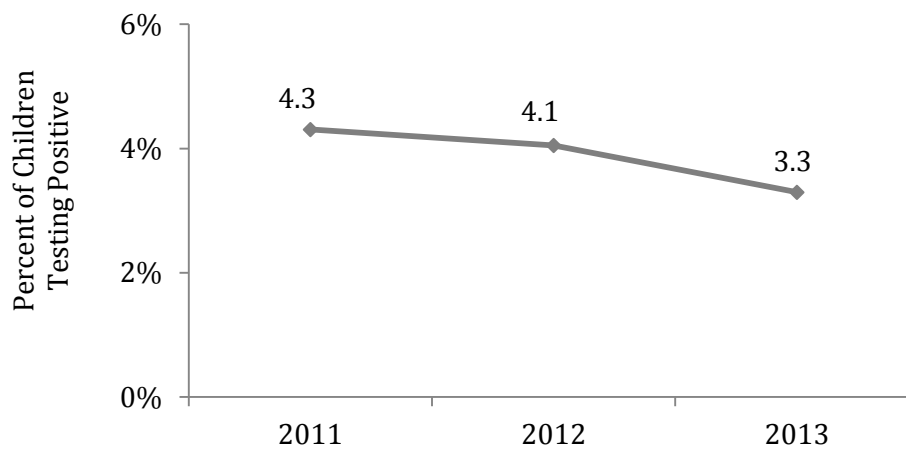
\*5-year annualized rates

NOTE: This index was determined by the number of times (shown in parentheses in the legend) the neighborhood falls into the highest or 2nd highest quartile for each of the three birth outcomes shown.

DATA SOURCES: Infant Deaths: Boston resident live births and deaths, Massachusetts Department of Public Health.  
Preterm births and low birthweight births: Boston resident live births, Massachusetts Department of Public Health.

**Boston Infant Deaths: 5.5**  
**Boston Preterm Births: 9.5% of live births**  
**Boston Low Birth Weight Births: 9.0% of live births**

**Figure 5.15 Elevated Blood Lead Levels\*  
by Year**

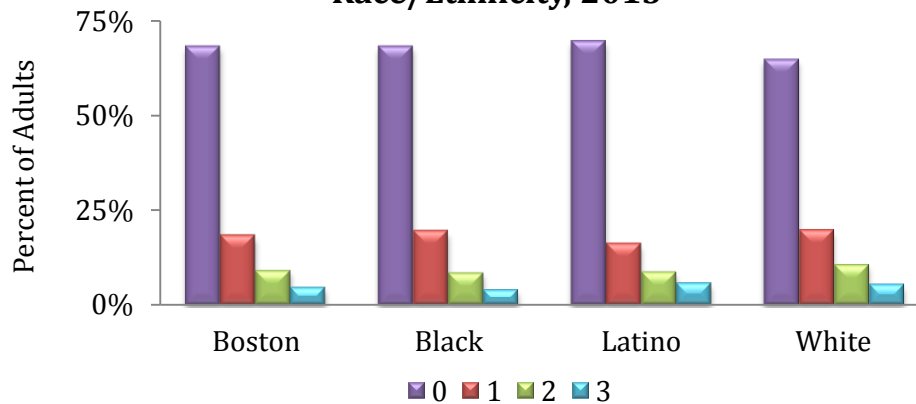


\*Based on 2012 CDC recommendation of  $\geq 5$  ug/dl. Elevated blood lead level data in this report are not comparable to data in previous Health of Boston reports due to definitional change. For more information see Blood-Lead Level in the Technical Notes.

DATA SOURCE: Childhood Lead Poisoning Prevention Program (CLPPP), Massachusetts Department of Public Health

In 2011, 4% of Boston children under age 6 tested positive for elevated blood lead levels. In 2013, 3% of Boston children under age 6 tested positive for elevated blood levels.

**Figure 5.16 Total Number of Adverse Childhood Experiences (ACEs) Among Adults by Race/Ethnicity, 2013**



	Boston	Black	Latino	White
0	68.3% (66.2-70.4)	68.3% (64.4-72.2)	69.7% (64.9-74.6)	64.8% (61.5-68.0)
1	18.2% (16.5-19.9)	19.4% (16.1-22.7)	16.1% (12.3-19.8)	19.5% (16.9-22.1)
2	9.0% (7.7-10.3)	8.4% (6.1-10.7)	8.6% (5.7-11.5)	10.5% (8.4-12.6)
3	4.5% (3.5-5.6)	3.9% (2.2-5.7)	5.6% (2.7-8.5)	5.2% (3.6-6.9)

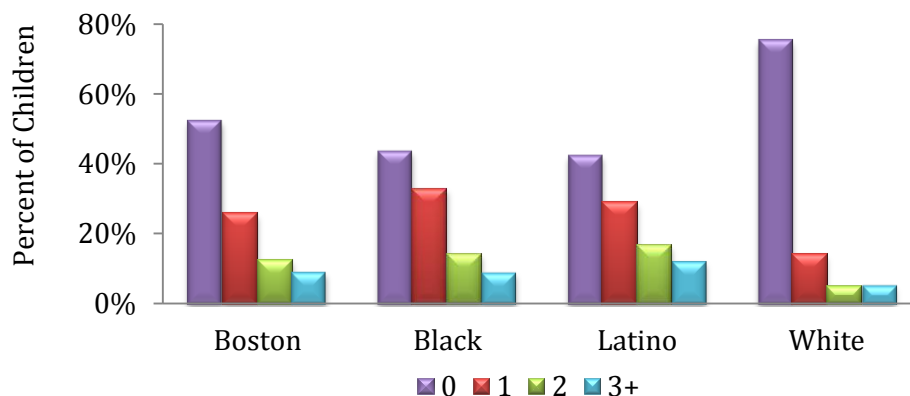
NOTE: Rates could not be presented for Asian residents due to an insufficient sample size.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The Adverse Childhood Experiences (ACE) questions were asked of Boston residents to assess associations between childhood maltreatment, and health and well-being later in life. In 2013, Boston adults were asked 3 of the 10 questions from the original ACE module created by the Center for Disease Control (CDC). Adults participating in the survey were asked: 1) if they ever lived with a caregiver who was depressed, mentally ill, or suicidal; 2) if they ever lived with a caregiver who was a problem drinker or alcoholic, or someone who abused drugs; and 3) if their parents were ever physically violent towards each other. This chart captures the number of ACEs experienced by adults by race/ethnicity and for Boston overall.

In Boston in 2013, 5% of adult residents reported three ACEs. There were no significant differences in the number of ACEs experienced by Black and Latino adults compared to White adults.

**Figure 5.17 Total Number of Adverse Childhood Experiences (ACEs) Among Children by Race/Ethnicity, 2012**



	Boston	Black	Latino	White
0	52.5% (49.0-56.0)	43.8% (37.3-50.3)	42.6% (35.7-49.4)	75.4% (71.3-79.4)
1	25.9% (22.8-29.0)	33.0% (26.8-39.3)	28.9% (22.7-35.1)	14.2% (11.0-17.4)
2	12.5% (10.1-15.0)	14.3% (10.0-18.6)	16.6% (11.0-22.2)	5.0% (3.1-6.9)
3+	9.0% (7.0-11.0)	8.9% (5.4-12.4)	12.0% (7.8-16.2)	5.4% (3.4-7.4)

NOTE: Rates could not be presented for Asian residents due to an insufficient sample size.

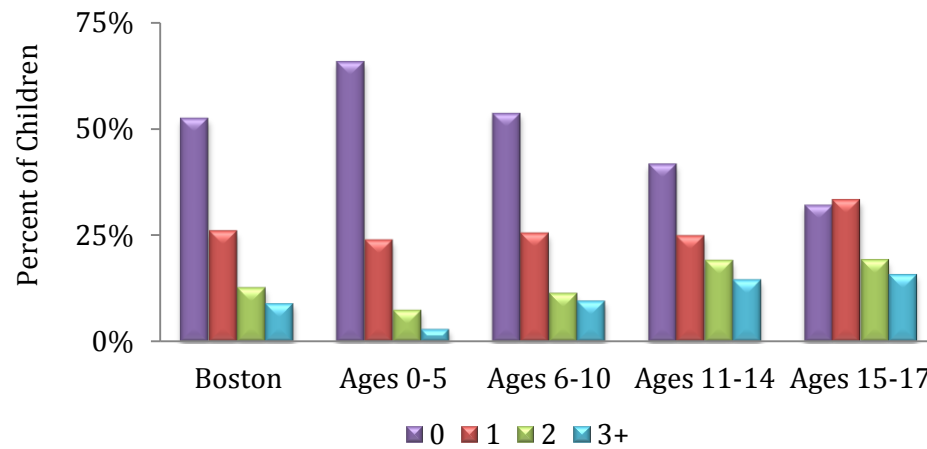
DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

In 2012, parents/caregivers of Boston children were asked nine of the 10 questions from the original ACE module.

The percentage of parents who report their child had experienced one or two ACEs was higher for Black and Latino children compared to White children. The percentage who reported three or more ACEs similar between Black and White children, but higher for Latino children compared to White children.



**Figure 5.18 Total Number of Adverse Childhood Experiences (ACEs) by Age, Children Ages 0-17, 2012**

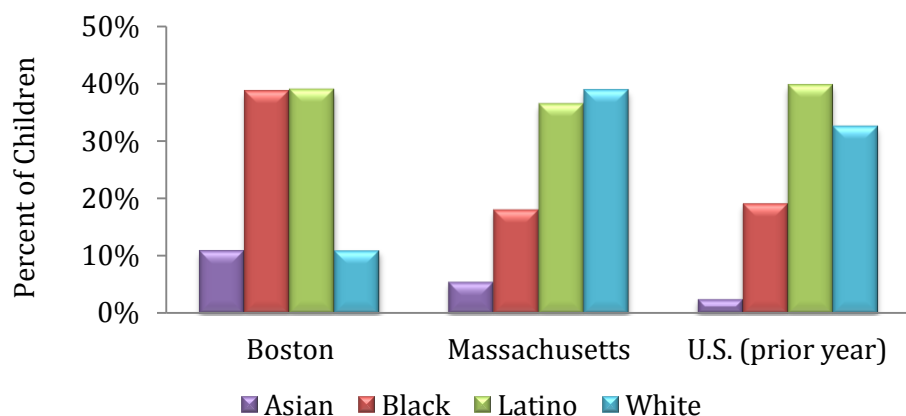


	Boston	Ages 0-5	Ages 6-10	Ages 11-14	Ages 15-17
0	52.5% (49.0-56.0)	65.8% (60.2-71.4)	53.7% (46.7-60.8)	41.8% (34.6-49.0)	32.2% (25.0-39.5)
1	25.9% (22.8-29.0)	23.8% (18.6-29.0)	25.4% (19.3-31.6)	24.8% (18.3-31.4)	33.2% (25.7-40.7)
2	12.5% (10.1-15.0)	7.4% (4.2-10.7)	11.2% (6.8-15.5)	18.8% (12.5-25.1)	18.9% (11.9-25.9)
3+	9.0% (7.0-11.0)	3.0% (1.4-4.6)	9.6% (5.7-13.6)	14.5% (9.1-20.0)	15.7% (8.9-22.4)

DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

In every age group, a significantly higher percentages of parents/caregivers reported their child experienced zero ACEs compared to those who reported one or more ACEs.

**Figure 5.19 Women, Infants and Children (WIC) Enrollment (Children 0-5 Years) by Race/Ethnicity, 2011**



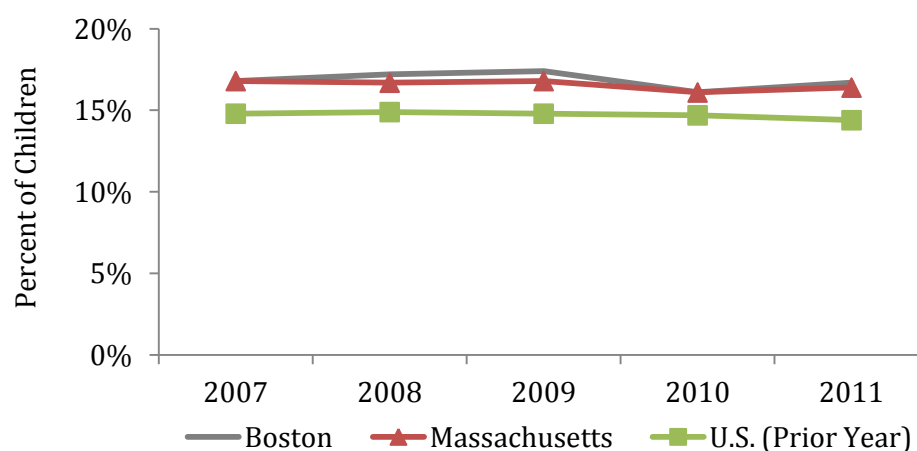
NOTE: Boston totals exclude Charlestown.

DATA SOURCE: Nutrition Division, Massachusetts Department of Public Health

In Boston, of the 23,870 children (ages 0-5) enrolled in WIC, 11% were Asian. Thirty-seven percent of children were Black, 39% were Latino and 11% were White. Compared to Massachusetts, which served 132,651 children, and the United States which served 8,672,965 children, Boston served larger percentages of Asian and Black children, but fewer White children.

In 2011, among the children ages 2-5 who were enrolled in WIC in Boston, 17% were obese. In Massachusetts during the same year, 16% were obese while in the United States, 14% were obese.

**Figure 5.20 Obesity Among 2-5 Year Olds Enrolled in WIC by Year**



NOTE: Boston totals exclude Charlestown.

DATA SOURCE: Nutrition Division, Massachusetts Department of Public Health

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