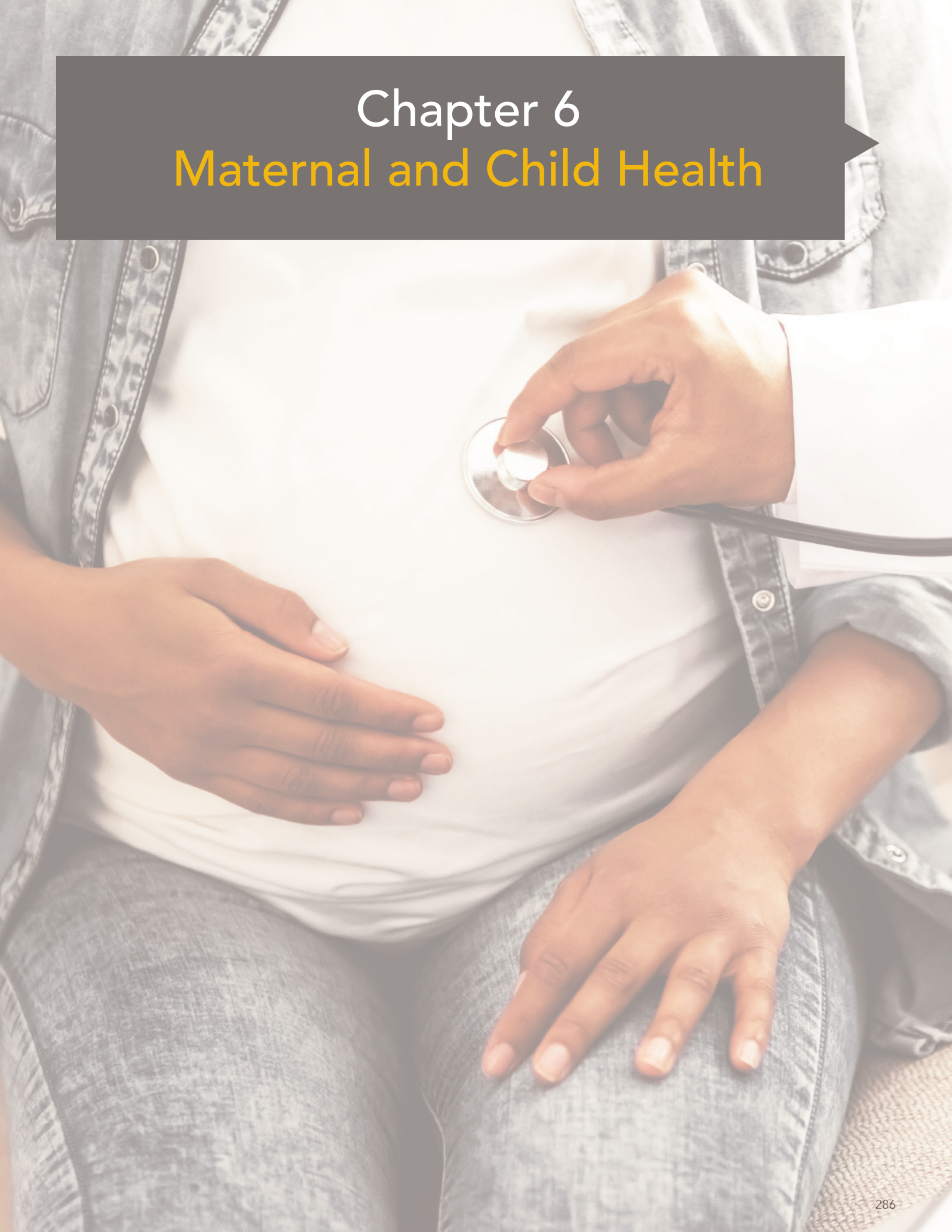


# Chapter 6

## Maternal and Child Health





# Maternal and Child Health

Birth rates, infant mortality rates (IMR), 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 of a community. This chapter looks at birth data, as well as some data on lead poisoning and adverse childhood events, or ACEs.

## Infant mortality

The IMR is a key marker of maternal and child health that has been used for decades to gauge social and economic progress, as well as the effectiveness of the healthcare system (1). Infant mortality is the death of an infant before his or her first birthday, usually due to birth defects, being born too soon (preterm birth) or too small (low birth weight), maternal pregnancy complications, injury to the child, or sudden infant death syndrome (2).

Substantial progress has been made in the 20th century in reducing infant mortality, resulting in an historic low of 5.8 deaths per 1,000 live births in the U.S. in 2014. Despite progress, the IMR for the U.S.—one of the wealthiest countries in the world—is worse than the 34 country-average of the nations participating in the Organization for Economic Cooperation and Development (OECD) (1). The OECD is a partnership of 35 nations working cooperatively to promote global economic prosperity for all people. The majority of the partner nations are in the developed world. In 2013 the average IMR in OECD countries was 3.8 deaths per 1,000 live births, with IMRs being the lowest in Iceland, Slovenia, Finland, and Japan, while the IMR in the U.S. was 6.0 deaths per 1,000 live births (1).

Significant inequities in IMR also occur across racial and ethnic groups in the U.S. In 2014, Black infants (11.4 per 1,000 live births) continue to die at more than twice the rate of White infants (4.8 per 1,000 live births) (3); for Latino infants, the IMR was 6.9 per 1,000 live births. From 2013 to 2014, the IMR decreased for White infants, but did not change significantly for Black or Latino infants.

## Preterm birth and low birth weight

Preterm birth (gestational age less than 37 weeks of completed pregnancy) and low birth weight (birth weight less than 5 pounds, 8 ounces or 2,500 grams) 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. Research also suggests that low birth weight and premature birth can lead to chronic disease in adulthood (4).

Preterm birth rates in the U.S. decreased from 10.4% in 2007 to 9.6% in 2015. Racial and ethnic inequities in preterm birth rates continue to exist (4). Preliminary data from 2015 reveal the rate of preterm birth among Black females (13.2%) was approximately 50 percent higher than the rate of preterm birth among White females (9.0%) (5). The preterm birth rate among Latino females in 2015 was 9.1% and among Asian females 8.6%.

Nationally, the low birthweight rate also decreased from 2007-2015. The low birthweight rate was 8.1% in 2015. In 2015, the rate of low birthweight among Asian (8.4%), Black (13.0%) and Latino (7.2%) females was higher than White females (7.0%) (5).

### **Risk factors**

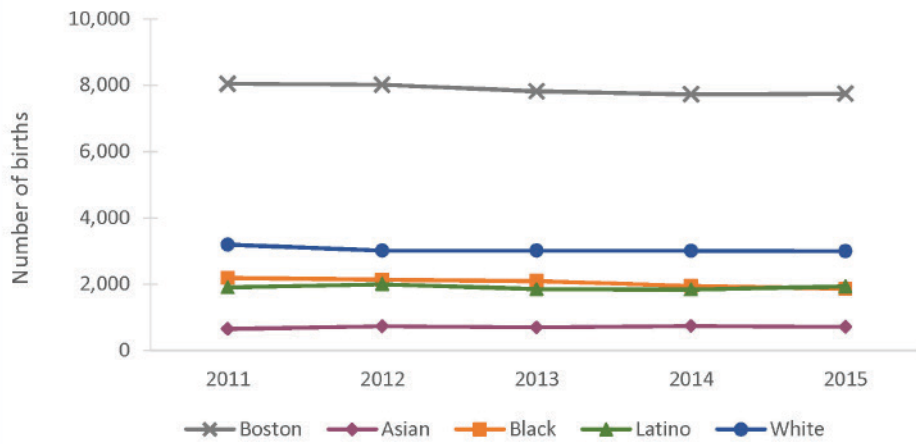
Rates of infant mortality, preterm birth and low birth weight are influenced by a variety of individual, socioeconomic, and environmental factors that impact children and families throughout their lives (6). Individual factors, such as the mother's health and health behaviors can certainly affect her pregnancy but growing evidence shows that external factors outside her control can also affect her pregnancy, including socioeconomic and environmental influences (e.g. living in low-resourced neighborhoods, housing instability). These may contribute to maternal stress and play an important role in pregnancy, low birth weight, and preterm birth (7-10).

The cumulative effect of constant stress endured by women over time may have an effect on mothers and their infants (11-16). These stressors include racism, violence, being poor, living in neighborhoods with poor housing, and inadequate access to health care (6, 15).

Experiencing racial discrimination and living in a country with a strong history of racial discrimination can damage health, even when the discrimination is not overt or intentional, regardless of socioeconomic status (13, 15, 17). 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 infant (6, 12, 15, 18). Hormonal changes that occur with persistent stressors during pregnancy can interfere with normal brain development in the infant. In addition, parental stress and environmental stressors (unemployment, low income, and substandard housing) are risk factors for childhood maltreatment and increased risk of health and social problems for children later in life (19).

In 2010, the Health Resources and Services Administration (HRSA) developed a set of 12 recommendations to reduce racial inequities in birth outcomes (6). The recommendations specifically aim to improve family, community, social and economic systems by strengthening father involvement, improving the integration of support services, creating social capital, investing in urban renewal and community building, closing the education gap, reducing poverty, supporting working mothers, and undoing racism (6).

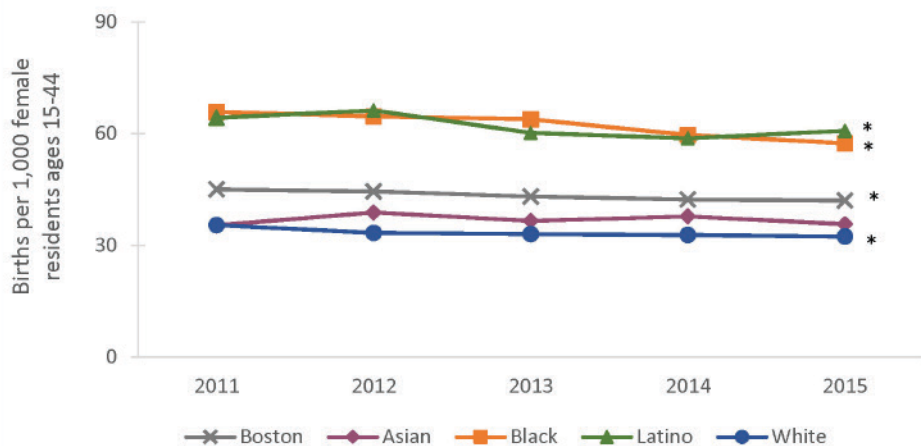
Figure 6.1 Birth Count by Race/Ethnicity and Year



In 2015, there were 7,741 births to Boston female residents. Of the births with reported race/ethnicity, 713 were to Asian females, 1,859 were to Black females, 1,930 were to Latino females, and 2,992 were to White females.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

6.2 Birth Rate by Race/Ethnicity and Year



In 2015, there were 42.1 births per 1,000 female Boston residents ages 15-44. From 2011-2015, the birth rate in Boston decreased. There was a decrease in the birth rate among Black, Latino, and White females from 2011-2015.

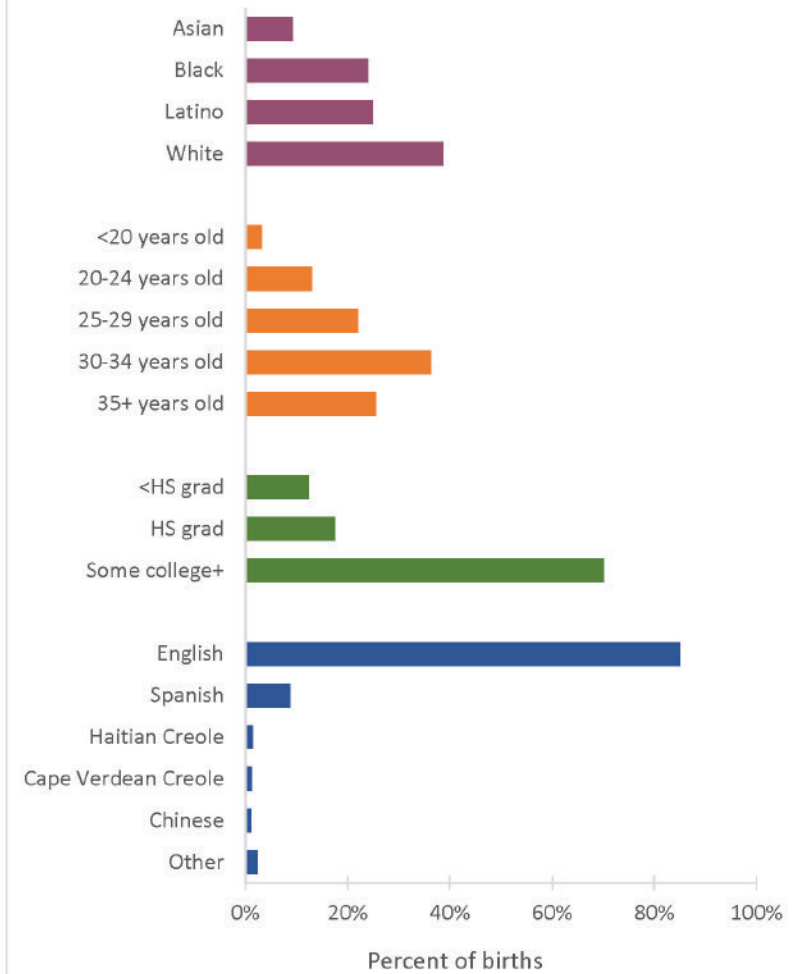
In 2015, the rates of births to Asian (35.7), Black (57.4), and Latino (60.8) females were higher compared with White females (32.4).

\* Statistically significant change over time

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

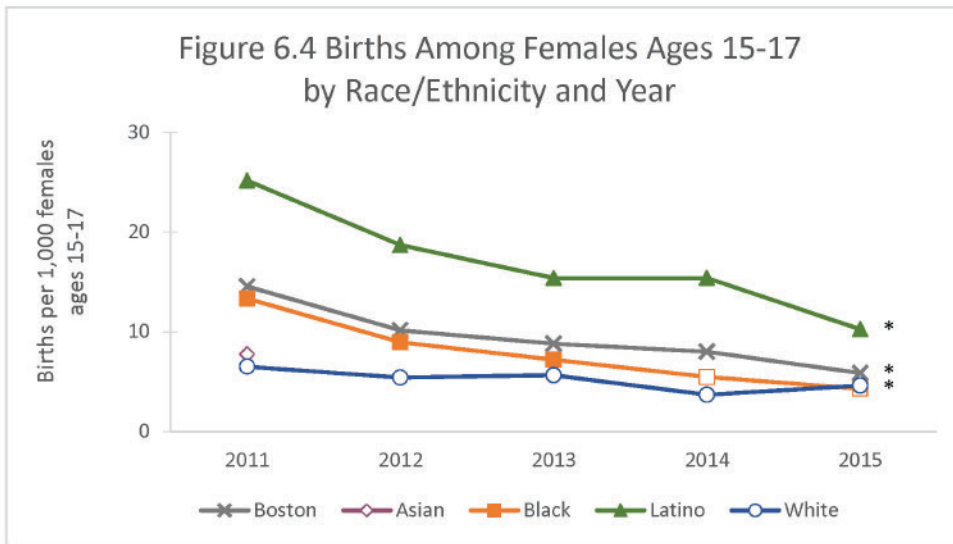
In 2015, 39% of births were to White females and 58% were to females of color. Sixty-two percent of births were to females 30 years of age or older, and 70% of females who gave birth had at least some college education. Eighty-five percent of births were to females whose preferred spoken language was English.

Figure 6.3 Births by Selected Indicators, 2015



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

Figure 6.4 Births Among Females Ages 15-17 by Race/Ethnicity and Year



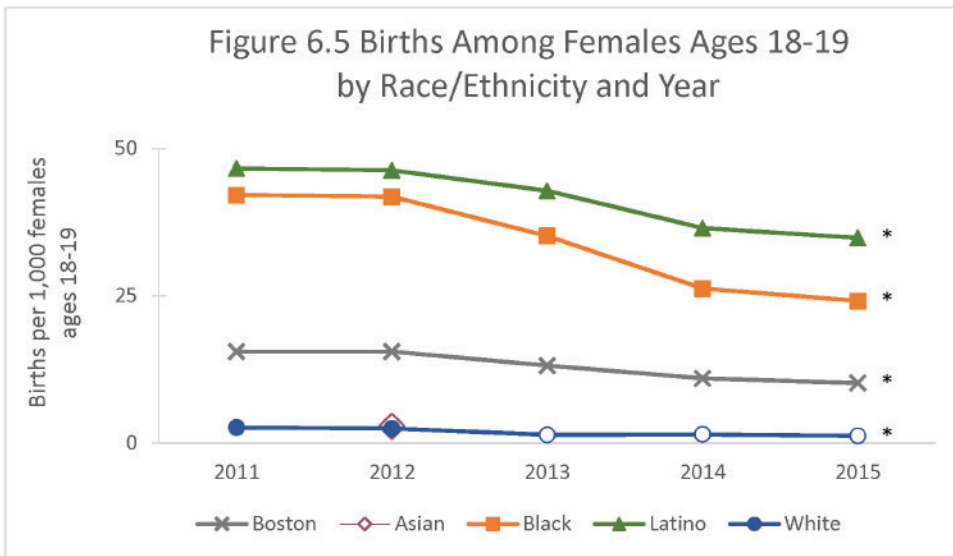
\* Statistically significant change over time

NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Rates are not presented due to a small number of cases for Asian female residents for 2012-2015.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

In 2015, the birth rate among Boston females ages 15-17 was 5.8 births per 1,000 females ages 15-17. From 2011-2015, the birth rate decreased from 14.5 to 5.8. A decrease in the birth rate from 2011-2015 was observed among Black and Latino females ages 15-17. In 2015, there were no significant differences in the birth rate by race/ethnicity.

Figure 6.5 Births Among Females Ages 18-19 by Race/Ethnicity and Year



\* Statistically significant change over time

NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Rates are not presented due to a small number of cases for Asian female residents for 2011 and 2013-2015.

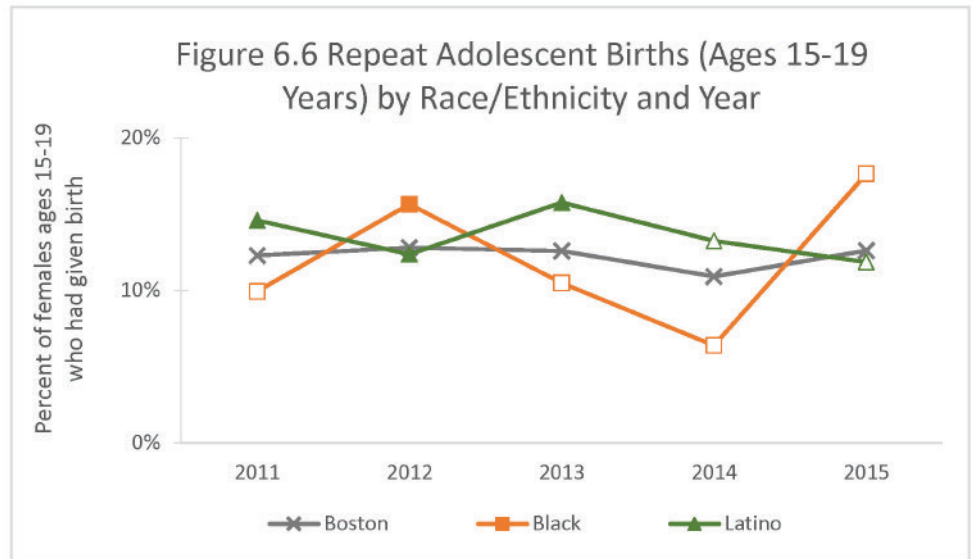
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

From 2011-2015, the birth rate for Boston females ages 18-19 decreased from 15.5 births per 1,000 females ages 18-19 to 10.2. The birth rate also decreased among Black, Latino, and White females ages 18-19 during the same time period.

In 2015, Black females ages 18-19 had a birth rate of 24.2 and Latino females had a birth rate of 34.8. These rates were higher than the rate of births to White females (1.2) in 2015.

Of the Boston females ages 15-19 who gave birth in 2015, 13% had given birth previously. There was no significant change in the percentage of teens with repeat births from 2011-2015 for Boston overall or by race/ethnicity.

In 2015, the percentage of Black females ages 15-19 who had given birth previously was 18% and the percentage of Latino females who had given birth previously was 12%.

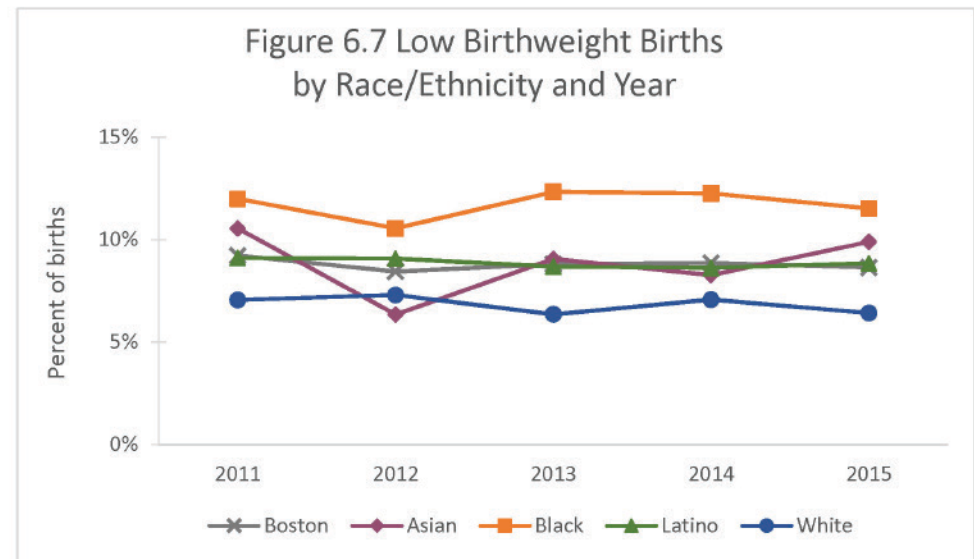


NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Rates are not presented due to a small number of cases for Asian or White female residents for 2011-2015.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

In 2015, 9% of all infants were born with low birthweight (weighing less than 5 pounds 8 ounces). From 2011-2015, the percentage of low birthweight births in Boston did not significantly change. There was also no significant change in the percentage of low birthweight births to Asian, Black, Latino, or White females during this same time period.

In 2015, Asian, Black, and Latino females all gave birth to higher percentages of low birthweight babies, 10%, 12%, and 9% respectively, than White females (6%).



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

### Low Birthweight Births

Healthy People 2020 Target: 7.8%

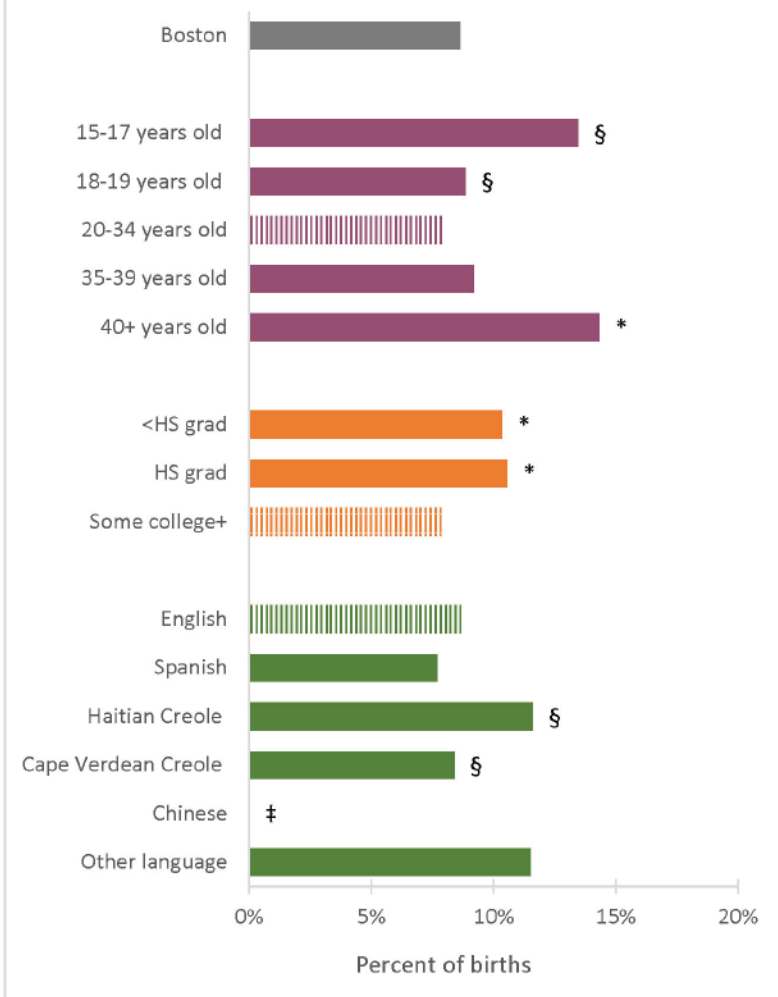
US 2015: 8.1%

MA 2015: 7.5%

Boston 2015: 8.6%



Figure 6.8 Low Birthweight Births by Selected Indicators, 2015



\* Statistically significant difference when compared to reference group

‡ Rates not presented due to a small number of cases

§ Rates are based on 20 or fewer cases and should be interpreted with caution.

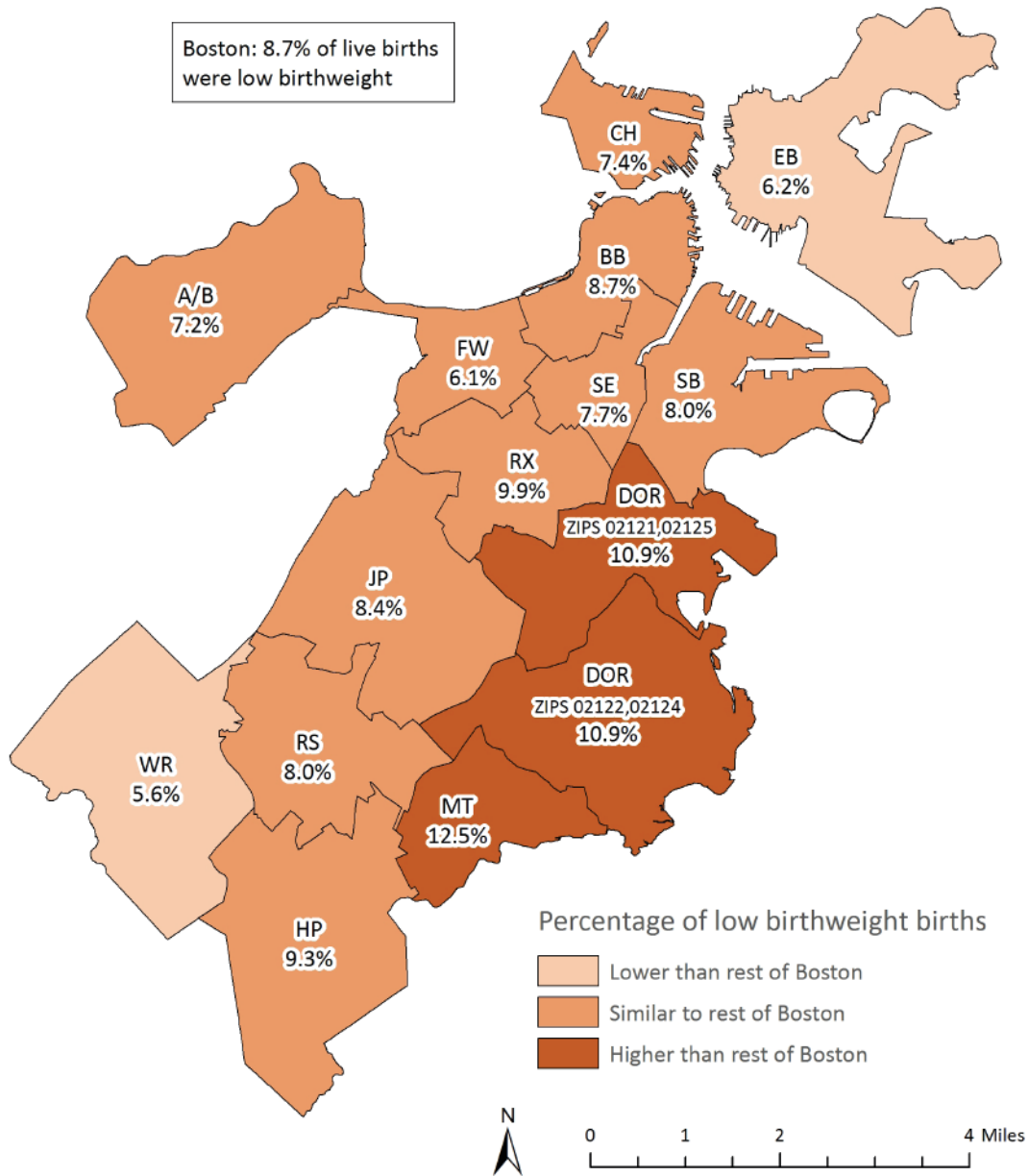
NOTE: Bars with patterns indicate the comparison group within each selected indicator.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

In 2015, 9% of all infants in Boston were born with low birthweight. A higher percentage of low birthweight births occurred among:

- Females with less than a high school diploma (10%) and those with a high school diploma (11%) compared with those with at least some college education (8%)
- Females 40 years of age or older (14%) compared with females 20-34 years of age (8%)

Figure 6.9 Low Birthweight Births, 2014-2015

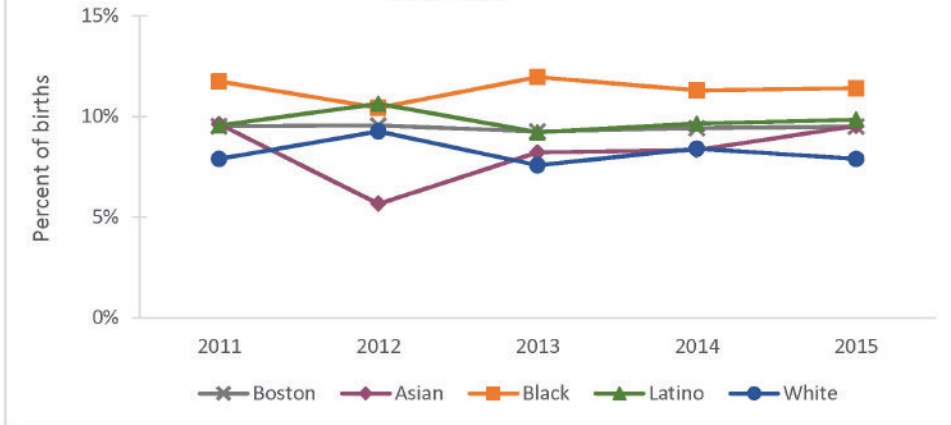


NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.  
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016).  
 Data may be updated as more information becomes available.

For 2014-2015, 9% of all infants in Boston were born with low birthweight. The percentage of low birthweight births was higher among females in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), and Mattapan compared with the rest of Boston. The percentage of low birthweight births was lower among females in East Boston and West Roxbury compared with the rest of Boston.

Figure 6.10 Preterm Births by Race/Ethnicity and Year



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

In 2015, 10% of babies in Boston were born preterm (before 37 weeks gestation). There was no significant change in the percentage of preterm births to Boston females from 2011-2015. This was also true for all racial/ethnic groups during the same time period.

In 2015, Black and Latino females had higher percentages of preterm births, 11% and 10% respectively, compared with White females, 8%.



### Preterm Births

Healthy People 2020 Target: 11.4%

US 2015: 9.6%

MA 2015: 8.4%

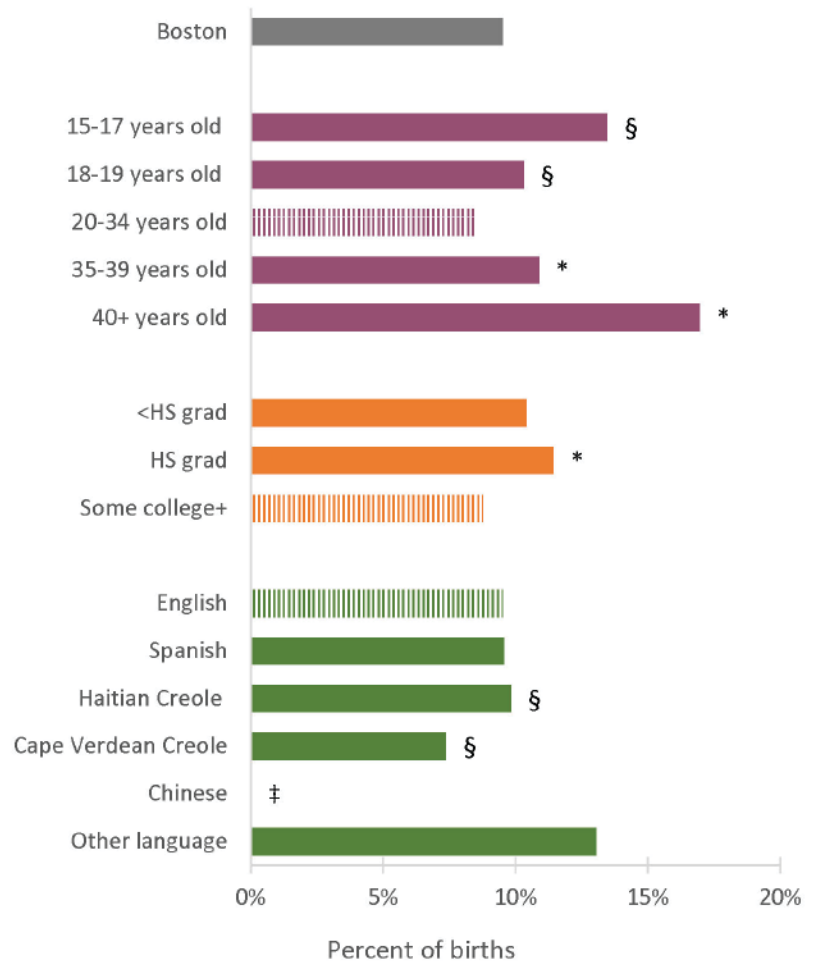
Boston 2015: 9.5%

In 2015, 10% of infants were born preterm.

A higher percentage of preterm births occurred to:

- Females with a high school diploma (11%) compared with those with at least some college education (9%)
- Females 35-39 years of age (11%) and 40 years of age or older (17%) compared with females 20-34 years of age (9%)

Figure 6.11 Preterm Births by Selected Indicators, 2015



\* Statistically significant difference when compared to reference group

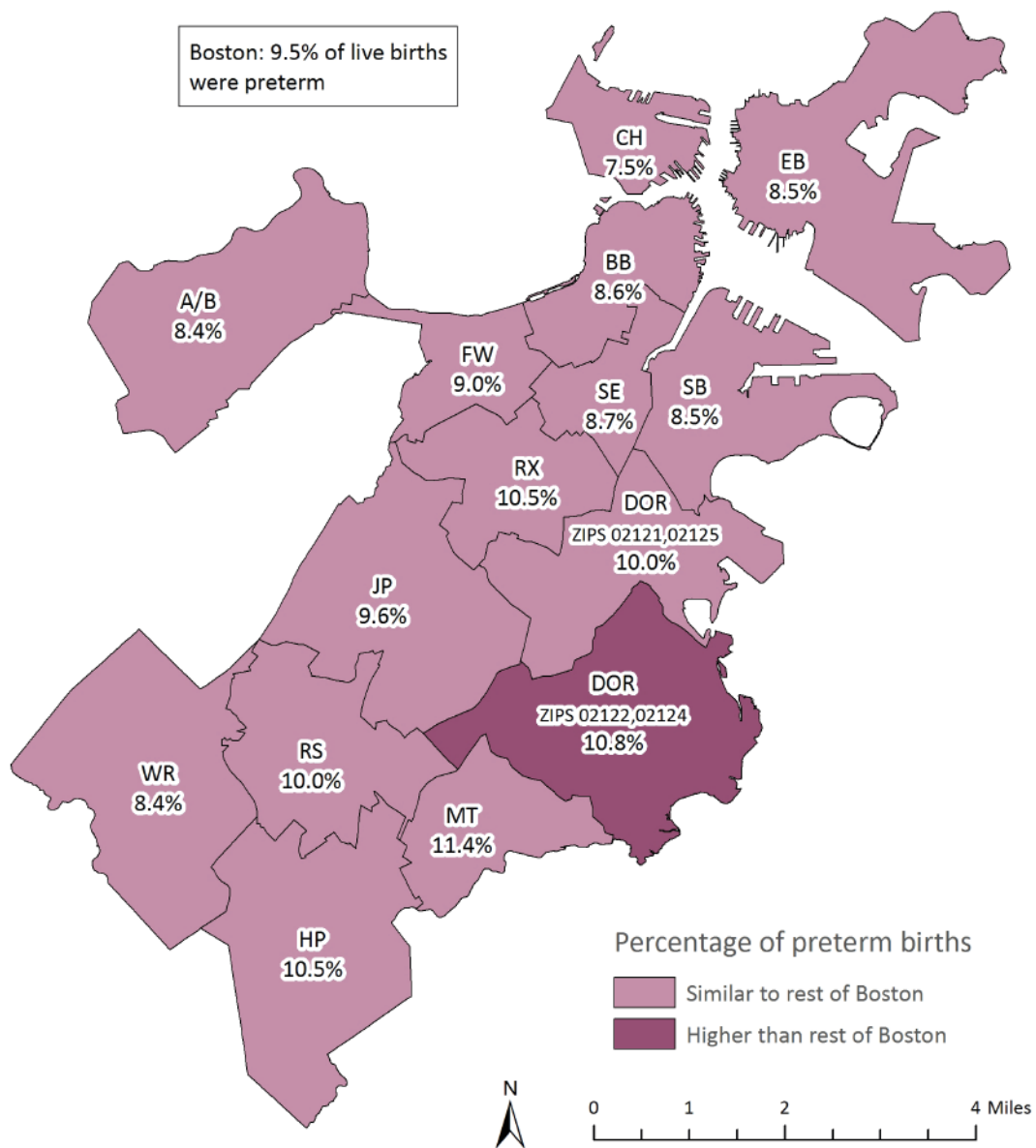
‡ Rates not presented due to a small number of cases

§ Rates are based on 20 or fewer cases and should be interpreted with caution

NOTE: Bars with patterns indicate the comparison group within each selected indicator.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016). Data may be updated as more information becomes available.

Figure 6.12 Preterm Births, 2014-2015



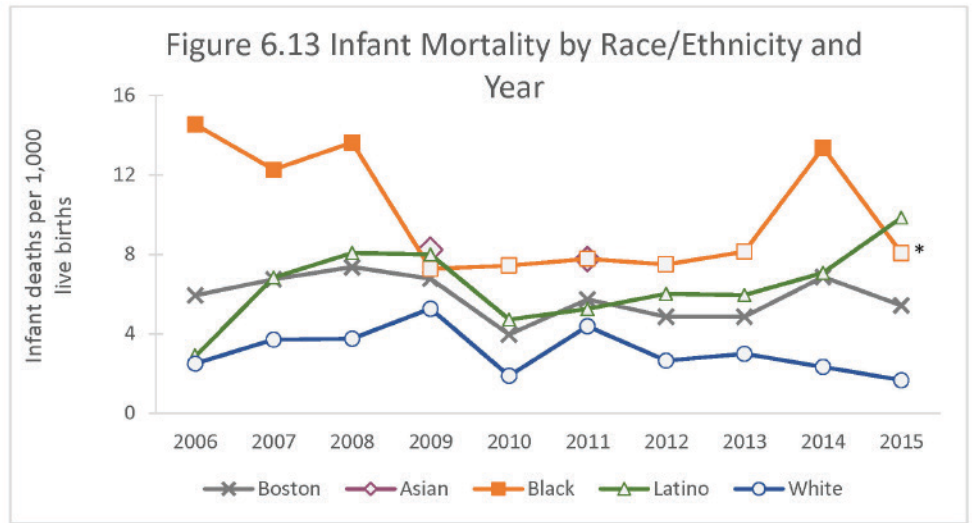
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.  
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health (data as of August 2016).  
 Data may be updated as more information becomes available.

For 2014-2015, 10% of all infants in Boston were born preterm. The percentage of preterm births was higher among females in Dorchester (zip codes 02122, 02124) compared with the rest of Boston.

In 2015, the infant mortality rate in Boston was 5.4 infant deaths per 1,000 live births. From 2006-2015, the rate for Black infants decreased by 36%. There was no significant change from 2006-2015 in the rate for Latino and White infants.

In 2015, the infant mortality rates for Black infants (8.1) and Latino infants (9.8) were higher than that of White infants (1.7).



\* Statistically significant change over time

NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Rates are not presented due to a small number of cases for Asian infants for 2006-2008, 2010, and 2012-2015. Beginning in October 2014, the method for collecting race/ethnicity for mortality data changed. Interpret trends with caution.

DATA SOURCE: Massachusetts linked infant birth-infant death file (death cohort), Massachusetts Department of Public Health (data as of February 2017). Data may be updated as more information becomes available.

### Infant Mortality

Healthy People 2020 Target: 6.0 infant deaths per 1,000 live births

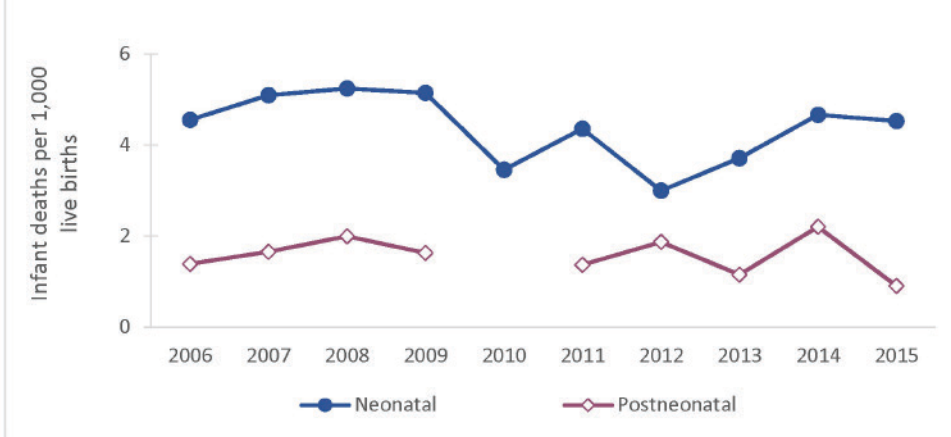
US 2015: 5.8

MA 2015: 4.4

Boston 2015: 5.4



Figure 6.14 Neonatal and Postneonatal Infant Mortality by Year



In 2015, there were 4.5 neonatal infant deaths per 1,000 live births (deaths within the first 28 days of life) and 0.9 postneonatal infant deaths per 1,000 live births (deaths between 28 days and 1 year after birth). From 2006-2015 there were no significant changes in the neonatal or postneonatal mortality rates.

NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Rates are not presented due to a small number of cases of postneonatal deaths for 2010.

DATA SOURCE: Massachusetts linked infant birth-infant death file (death cohort), Massachusetts Department of Public Health (data as of February 2017). Data may be updated as more information becomes available.



### Neonatal Infant Mortality

Healthy People 2020 Target: 4.1 infant deaths per 1,000 live births

US 2014: 3.9

MA 2014: 3.3

Boston 2015: 4.5

### Post Neonatal Infant Mortality

Healthy People 2020 Target: 2.0 infant deaths per 1,000 live births

US 2014: 1.9

MA 2014: 1.2

Boston 2015: 0.9

For 2012-2015 combined, conditions originating in the perinatal period was the most common cause of infant death for all racial/ethnic groups, as well as for Boston overall. This included deaths due to complications of pregnancy, labor, and delivery, disorders related to the length of gestation and fetal growth, birth trauma, respiratory and cardiovascular disorders specific to the perinatal period, and infections specific to the perinatal period.

Figure 6.15a Infant Mortality by Cause of Death, Boston Overall, 2012-2015

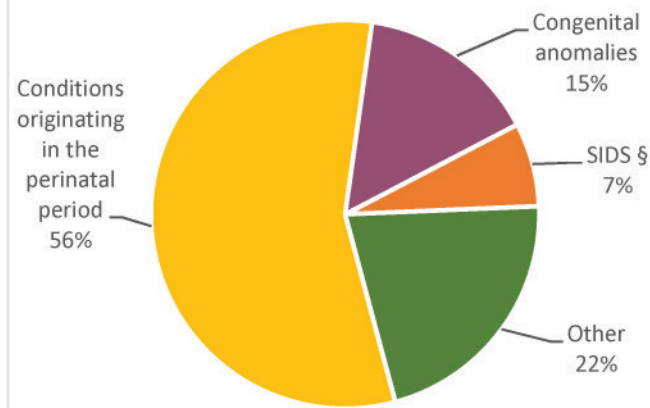


Figure 6.15b Infant Mortality by Cause of Death, Black Infants, 2012-2015

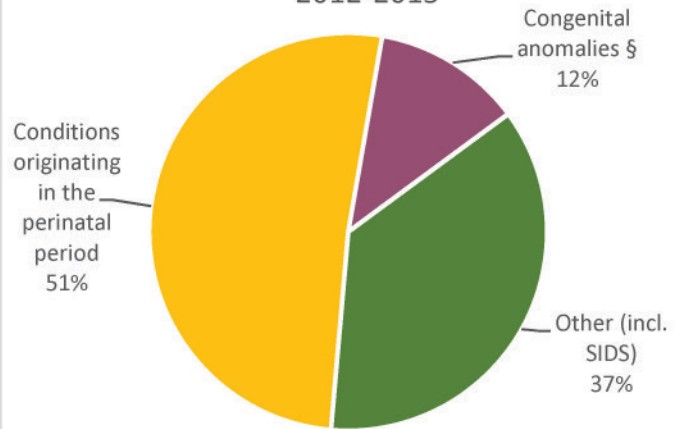


Figure 6.15c Infant Mortality by Cause of Death, Latino Infants, 2012-2015

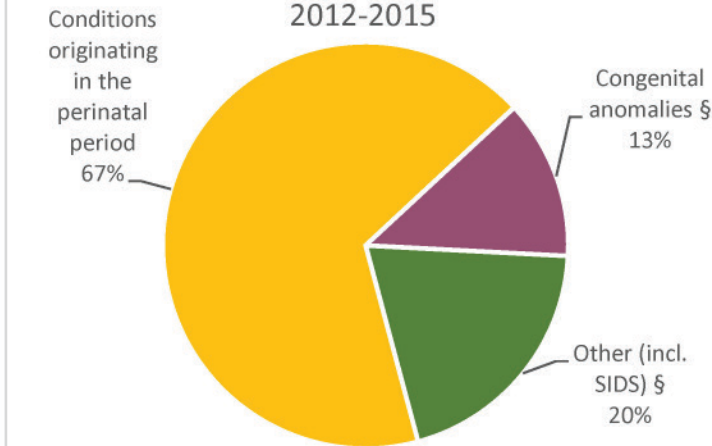
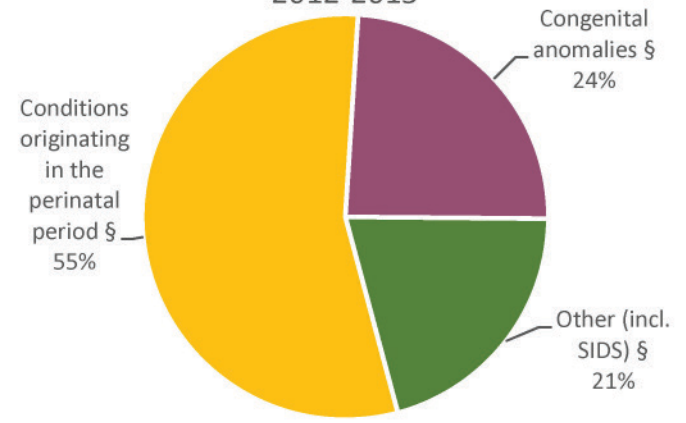


Figure 6.15d Infant Mortality by Cause of Death, White Infants, 2012-2015



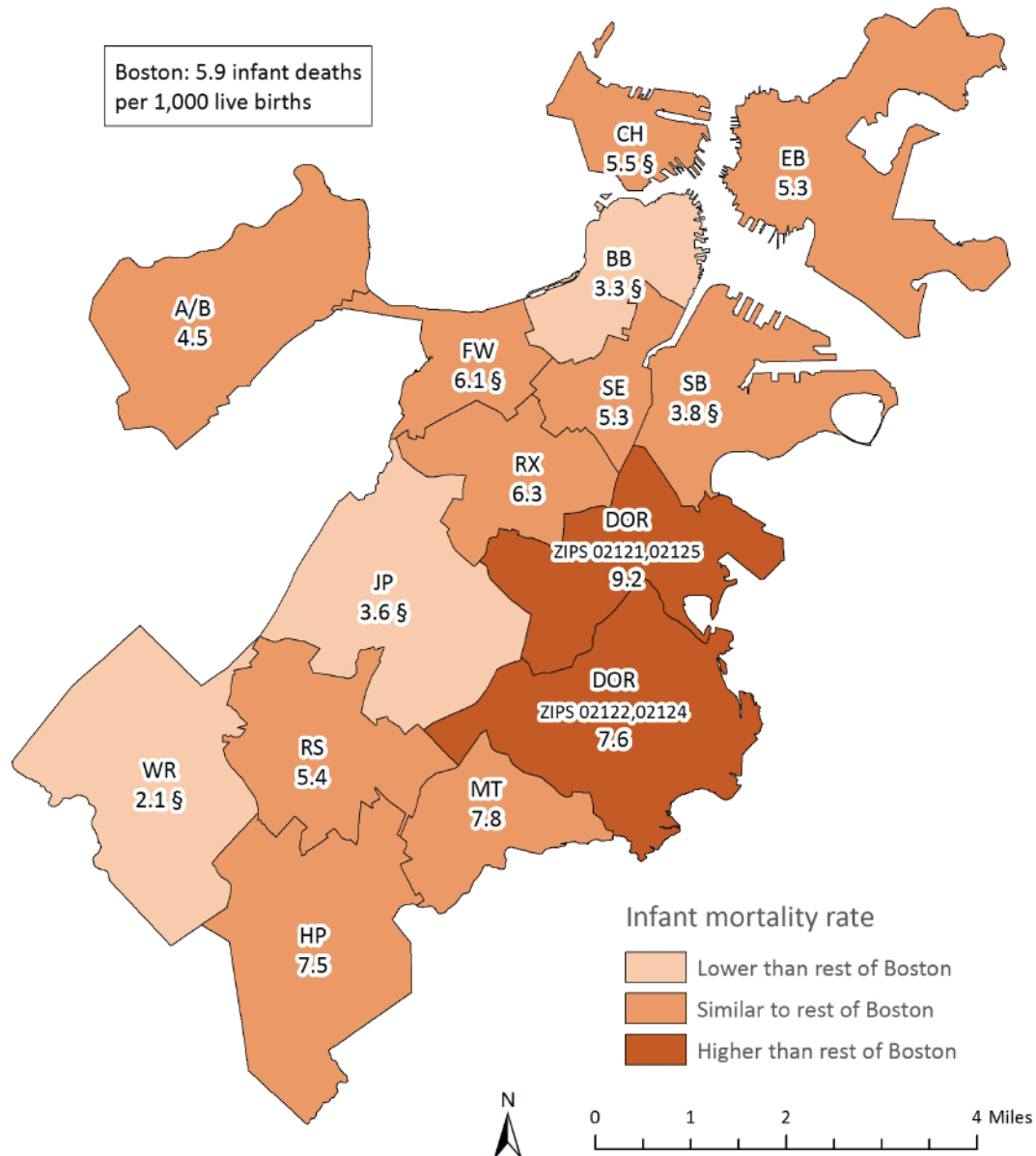
§ Rates are based on 20 or fewer cases and should be interpreted with caution.

NOTE: Rates are not presented due to a small number of cases for Asian infants.

DATA SOURCE: Massachusetts linked infant birth-infant death file (death cohort), Massachusetts Department of Public Health (data as of February 2017). Data may be updated as more information becomes available.



Figure 6.16 Infant Mortality  
by Neighborhood, 2006-2015



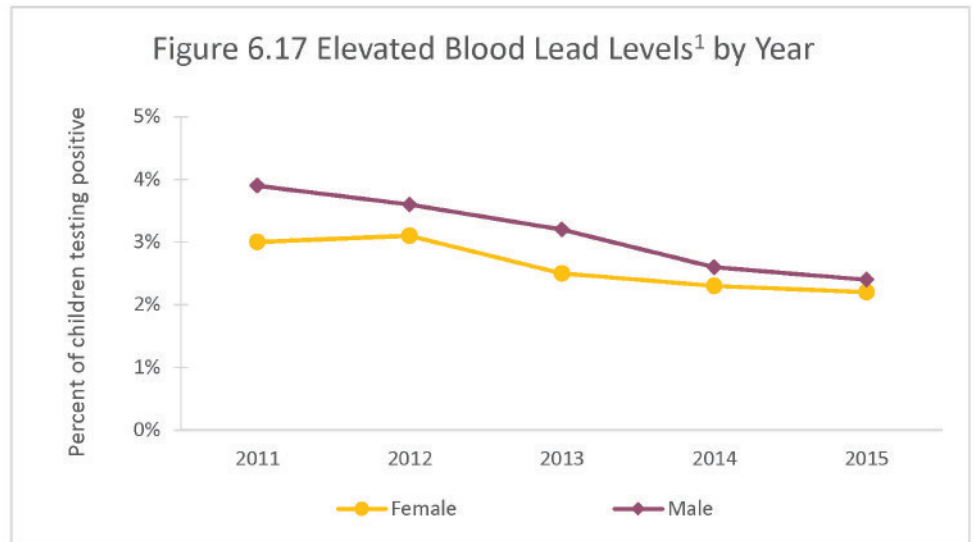
§ Rates are based on 20 or fewer cases and should be interpreted with caution.

NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.  
"SE" includes the South End and Chinatown.

DATA SOURCE: Massachusetts linked infant birth-infant death file (death cohort), Massachusetts Department of Public Health (data as of February 2017). Data may be updated as more information becomes available.

For 2006-2015, the infant mortality rate in Boston was 5.9 infant deaths per 1,000 live births. Dorchester (zip codes 02121, 02125) and Dorchester (zip codes 02122, 02124) had infant mortality rates that were higher than the rest of Boston. Back Bay, Jamaica Plain, and West Roxbury had infant mortality rates that were lower than the rest of Boston.

In 2015, approximately 2% of male and female children under age 6 tested positive for elevated blood lead levels.



<sup>1</sup> Based on the 2012 CDC recommendation of  $\geq 5$  ug/dl. For more information see Blood-Lead Level in the Technical Notes.

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



## Adverse Childhood Experiences

Adverse Childhood Experiences (ACEs) are stressful or traumatic events, including abuse and neglect that occur during childhood. They also include household dysfunction such as witnessing domestic violence or growing up with family members who have a mental health disorder, substance use disorder and/or are incarcerated (20). ACEs are strongly related to the development of a wide range of health behaviors (smoking, high risk sexual behavior and substance misuse) and health problems (fetal death, depression, anxiety, sleep disorders, diabetes, cancer, cardiovascular disease and early death) throughout an individual's life (21-23).

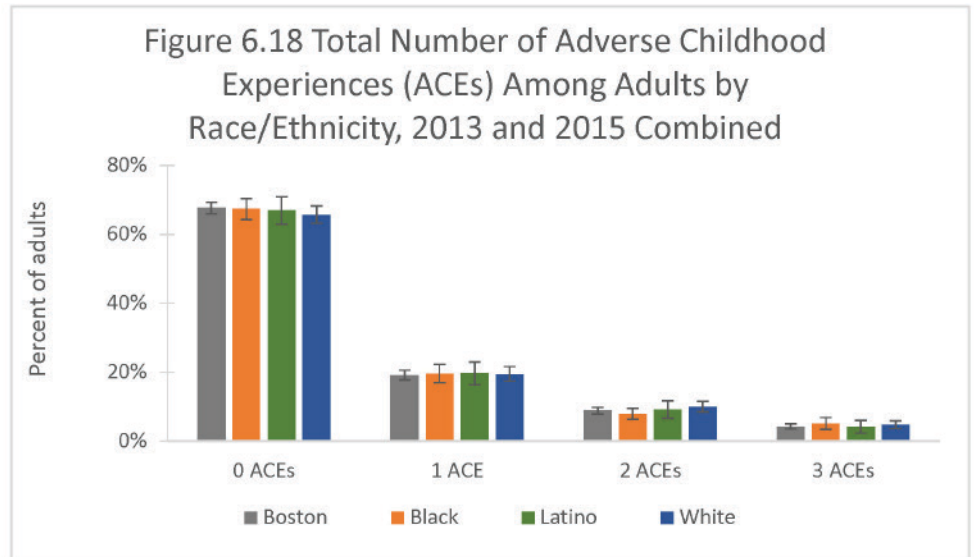
The risk of poor health increases as the number of adverse childhood events a person has experienced increases (20-22). To assess a person's exposure to ACEs, the Centers for Disease Control and Prevention (CDC) developed a survey tool with 10 questions that generates an ACE score. An adult's ACE score is not only associated with their own health outcomes, but can also impact their parenting and thus have intergenerational effects (20). A parent's exposure to ACEs as well as other social determinants of health, such as employment and income, can impact a parent's ability to provide a supportive environment and relationship with their child (21, 22).

Another critical factor in this cycle is the impact of racism. Racism contributes to the inequitable access to social, economic, and other health-promoting resources (i.e. social determinants of health), which in turn impact childhood experiences, and thus social, economic, mental, and physical well-being later in life (23).

Because of the range of health and social impacts of ACEs, prevention of these events and reducing their impact are important (20). Safe, supportive, healthy and stable relationships can reduce the influence of ACEs (20). With acknowledgement of one's own ACEs and with support, parents can learn skills to prevent ACEs in their own children (24). Additionally, trauma-informed care in schools, the criminal justice system, housing systems, and places of health care can help to treat trauma caused by adverse experiences (25, 26).

The Adverse Childhood Experiences (ACE) questions were asked of Boston adult residents to assess associations between childhood maltreatment, and health and well-being later in life. In 2013 and 2015, residents were asked 3 of the 10 questions from the original ACE module created by the CDC, including: 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 misused 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 for 2013 and 2015 combined, 19% of adults reported one ACE, 9% reported 2 ACEs, and 4% reported three ACEs. There were no significant differences by race/ethnicity when comparing adults with 0 ACEs to those with 1 or more ACEs.



NOTE: Data were not presented for Asian residents due to insufficient sample size.  
 DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

## Summary

Adolescent birth rates continue to decline in Boston. From 2011-2015, the birth rate among females ages 15-17 decreased by 57%, and the birth rate among females ages 18-19 decreased by 38%. For some key indicators, there has been dramatic reduction in differences between racial/ethnic groups. The adolescent birth rates for Black and Latino females ages 15-17 declined 68% and 55%, respectively, from 2011-2015. In fact, there was no difference in the 2015 adolescent birth rates for Asian, Black, and Latino females ages 15-17 compared to their White counterparts. From 2006-2015, the infant death rate for Black infants decreased by 36%.

Racial and ethnic inequities continue to persist for other key indicators of maternal and child health. The percentage of births that were either low birthweight or preterm in 2015 was much higher among Black and Latino than among White women. The percentage of births with low birthweight in 2015 was also higher among Asian than among White women. Similarly, the birth rate for women 18-19 years of age and the infant mortality rate, was much higher among Black and Latino residents compared with White residents in 2015. Inequities in low birthweight and preterm births were also found across categories of age and educational attainment. Inequities in these indicators tend to disproportionately affect women ages 40 and older and with a high school diploma or lesser educational attainment. At the neighborhood level, Dorchester (zip codes 02122, 02124) in particular had elevated percentages of births that were either low birthweight or preterm compared to the rest of Boston. Dorchester (zip codes 02121, 02125) and Mattapan also had elevated percentages of births with low birthweight. Dorchester (zip codes 02121, 02125) and Dorchester (zip codes 02122, 02124) also had higher infant mortality rates compared to the rest of Boston. To reduce the racial/ethnic and social inequities in birth outcomes for Boston, multi-sector interventions that target subpopulations at higher risk should address preconception care, as well as the chronic stressors endured by women over time, which include and are not limited to domestic violence, racism, living in neighborhoods with violent crime, and inadequate access to health resources and services.

# Maternal and Child Health

Teen birth rate decreased among Latino females ages 15-17



**25.2 to 10.2**  
births per 1,000 births from 2011-2015

Teen birth rate decreased among Black females ages 18-19



**42.1 to 24.2**  
births per 1,000 births from 2011-2015



From 2006 to 2015, the infant mortality rate for Black infants decreased **36%**



# Our Point of View: Thoughts from public health

## Social Equality and Infant Health

By Deborah Allen

Child, Adolescent and Family Health Bureau Director, 2008-2017

Boston Public Health Commission

Many cities around the country look to Boston as a leader in infant health and survival. Overall, our statistics justify that. We have a citywide infant mortality rate that first fell below the national 2020 goal for infant survival in 2003 and has been consistently below that benchmark since 2009. But as we see throughout this report, the overall rate is just part of the story. Our focus should not be on how we do citywide, but on how different subgroups in our population fare.

It's partly a matter of poverty: when women are poor, they can't buy good food, live in warm and welcoming homes, get enough of the right kinds of exercise, and feel safe when they are out and about. And all of those factors affect the woman and during pregnancy, her baby.

Infant mortality is also about social marginalization and the stress that comes with being marginalized<sup>1</sup>. The current view is that the experience of discrimination – for example, of being a professional woman of color who finds her views ignored or disparaged by others – results in a physiological stress response that, repeated over and over, puts a growing fetus at risk.

To improve birth outcomes in the city, to attain birth outcomes for Black and Latino women that match those of White women, we have to be prepared to intervene at each step in the pathway from social inequality to poor birth outcomes. That means:

- **Striving for social equality.** An increased minimum wage, Earned Income Tax Credits, and paid sick leave are proven ways to address unequal outcomes due to unequal resources.
- **Taking on racism and other forms of marginalization.** We can't expect equal outcomes if women are exposed to racism and discrimination in our workplaces, schools, streets, parks, stores and airwaves. It takes a village to raise a child – but before that, the village has to embrace the child's mother, making her feel a valued part of her community.
- **Providing support for women whose health has been compromised by social conditions and stress.** This calls for access to high quality health care for all Bostonians and special programs to support women at risk. Two programs that are promoted through the work of BPHC are One Key Question® which aims to improve women's health before pregnancy, and Centering Pregnancy, a model that combines prenatal care with a woman-to-woman group support.

<sup>1</sup>Pathik D. Wadhwa, MD, PhD, Sonja Entringer, PhD, Claudia Buss, PhD, and Michael C. Lu, MD, MPHd. The Contribution of Maternal Stress to Preterm Birth: Issues and Considerations. Clin Perinatol. 2011 Sep; 38(3): 351–384.

## Our Point of View: Thoughts from a community resident

### Group prenatal care – an empowering option

By Keiana Cox

Keiana Cox is a mother to her 1-year-old daughter and a full-time student interested in early childhood education.

I participated both in BPHC's Boston Healthy Start Initiative and the Centering Pregnancy program, a group prenatal care program for pregnant women at Boston Medical Center.

Being able to participate in group prenatal care was an awesome experience. Not only did it cut down on waiting times -- we were all seen in a group rather than one-on-one – but I also got to meet other women who were going through the same experience as I was. Being able to meet with them and hear that they had the same questions and concerns I did was helpful.

Even now, a lot of us stay in touch. In fact, I have one really good friend that I made through the program. We go to school together now and know each other's kids. The other great thing about the program was that we learned how to do a lot of things ourselves – like how to take our blood pressure, weigh ourselves, and listen for our baby's heartbeats. It was really empowering to learn how to do those things on our own.

There's nothing I would change about the program or my experience except maybe to have the fathers be more involved so that they could be more engaged in the process. Other than that, it was a great experience that I would recommend to anyone.



## References

1. The Organisation for Economic Co-operation and Development (OECD). Health at a Glance 2015: OECD Indicators, Infant Mortality. Paris, France: OECD Publishing; 2015. p. 58-9.
2. Centers for Disease Control and Prevention, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion. Maternal and Infant Health: Infant Mortality 2016 [December 28, 2016]. Available from: <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>.
3. Kochanek KD, Murphy SL, Xu J, Tejada-Vera B. Deaths: Final Data for 2014. National Vital Statistics Report. 2016;65(4):1-122.
4. Centers for Disease Control and Prevention, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion. Reproductive Health: Maternal and Infant Health, Preterm Birth 2016 [January 4, 2017]. Available from: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm>.
5. Hamilton BE, Martin JA, Osterman MJ. Births: Preliminary Data for 2015. National Vital Statistics Report. 2016;65(3):1-15.
6. Lu MC, Kotelchuck M, Hogan V, Jones L, Wright K, Halfon N. Closing the Black-White gap in birth outcomes: a life-course approach. Ethnicity & disease. 2010;20(1 Suppl 2):S2-62-76.
7. Healthy People, Office of Disease Prevention and Health Promotion. Healthy People 2020: Maternal, Infant and Child Health [03/24/17]. Available from: <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health?topicid=26>.
8. Miranda ML, Maxson P, Edwards S. Environmental contributions to disparities in pregnancy outcomes. Epidemiologic reviews. 2009;31:67-83.
9. Nowak AL, Giurgescu C. The Built Environment and Birth Outcomes: A Systematic Review. MCN The American journal of maternal child nursing. 2017;42(1):14-20.
10. Braveman P. Black-White Disparities in Birth Outcomes: Is Racism-Related Stress a Missing Piece of the Puzzle? Handbook of Black Health. 2011:155-63.
11. Roberts EM. Neighborhood social environments and the distribution of low birthweight in Chicago. American journal of public health. 1997;87(4):597-603.
12. Hogue CJ, Bremner JD. Stress model for research into preterm delivery among black women. American journal of obstetrics and gynecology. 2005;192(5 Suppl):S47-55.
13. Nuru-Jeter A, Dominguez TP, Hammond WP, Leu J, Skaff M, Egerter S, et al. "It's the skin you're in": African-American women talk about their experiences of racism. an exploratory study to develop measures of racism for birth outcome studies. Maternal and child health journal. 2009;13(1):29-39.
14. Rosenthal L, Lobel M. Explaining racial disparities in adverse birth outcomes: unique sources of stress for Black American women. Social Science and Medicine. 2011:977-83.

15. Giurgescu C, Zenk SN, Dancy BL, Park CG, Dieber W, Block R. Relationships among neighborhood environment, racial discrimination, psychological distress, and preterm birth in African American women. *Journal of obstetric, gynecologic, and neonatal nursing* : JOGNN. 2012;41(6):E51-61.
16. Giurgescu C BA, Dancy BL, Norr K.,. Black women's views of factors impacting preterm birth. *American Journal of Maternal Child Nursing*. 2013:229-34.
17. Braveman P, Gottlieb L. The social determinants of health: it's time to consider the causes of the causes. *Public health reports (Washington, DC : 1974)*. 2014;129 Suppl 2:19-31.
18. Giurgescu C, Zenk SN, Engeland CG, Garfield L, Templin TN. Racial Discrimination and Psychological Wellbeing of Pregnant Women. *MCN The American journal of maternal child nursing*. 2017;42(1):8-13.
19. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. *Child Maltreatment: Risk and Protective Factors 2016* [February 3, 2017]. Available from: <http://www.cdc.gov/violenceprevention/child-maltreatment/riskprotectivefactors.html>.
20. Substance Abuse and Mental Health Services Administration. *Prevention and Behavioral Health: Adverse Childhood Experiences* [12/15/16]. Available from: <https://www.samhsa.gov/capt/practicing-effective-prevention/prevention-behavioral-health/adverse-childhood-experiences>.
21. Bharmel N, Derose KP, Felician M, Weden MM. *Understanding the Upstream Social Determinants of Health* Rand Corporation, 2015.
22. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. *Essentials for Childhood Framework: Steps to Create Safe, Stable, Nurturing Relationships and Environments for All Children* [12/15/16]. Available from: <https://www.cdc.gov/violenceprevention/childmaltreatment/essentials.html>.
23. Wade R. *Toxic Stress and Health: The Impact of Childhood Exposure to Racism. Racism and Its Impact on Children's Health* 2015.
24. Stevens J. *Troubled Moms and Dads Learn How to Parent with ACEs* 2016 [December 15, 2016]. Available from: <https://acestoohigh.com/2016/05/08/troubled-moms-and-dads-learn-how-to-parent-with-aces/>.
25. SAMHSA-HRSA Center for Integrated Health Solutions. *Clinical Practice: Trauma* [12/15/16]. Available from: <http://www.integration.samhsa.gov/clinical-practice/trauma>.
26. US Department of Health and Human Services, Administration for Children and Families, Children's Bureau. *Responding to Abuse and Neglect: Trauma Informed Practice* 2015 [12/15/16]. Available from: <https://www.childwelfare.gov/topics/responding/trauma/>.