HEALTH OF BOSTON 2023

THE MATERNAL AND INFANT HEALTH REPORT

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FOREWORD

Welcome to the Boston Public Health Commission's (BPHC) Health of Boston 2023: The Maternal and Infant Health Report. This is one of a series of reports providing surveillance data on the health of Boston. It aims to provide residents, medical and public health professionals, health policy makers, and community advocates with actionable information about pregnancy, births, and infant deaths among Boston residents. Data sources include the US census, Massachusetts birth registries and death registries.

BPHC acknowledges the role of racism in creating and perpetuating systems of oppression that undermine the social determinants of health and have resulted in the historic marginalization and subsequent inequities in health outcomes among Black, Indigenous, and people of color in Boston.

In this report we examine the latest available data from 2021 and for many indicators report on the trends over time for the time period between 2017 and 2021. To compare rates across neighborhoods we combine data from multiple years. We report on the findings by neighborhood, race, ethnicity and other demographic subgroups (i.e., language spoken, age, education). We hope you find the information presented here useful in your own efforts to educate, inspire, advocate, and intervene in the interest of health equity and optimal health for all Boston residents.

DATA SUMMARY

Racial and ethnic inequities continue to persist for key indicators of maternal and infant health. Although the percentage of births that were either low birthweight or preterm for Boston overall were lower than the national rate, the percentages were much higher among Black and Latinx residents compared to White residents.

Birth Count and Rates:

- The **annual birth count** has declined steadily since 2017 from 7,728 to 6,788 in 2021; a 12% decrease. This decrease is evident among Asian, Black, and Latinx residents, while the birth count among White residents remained stable.
- The overall **birth rate** declined by 14.8% between 2017 and 2021. This decrease in births per 1,000 female residents differed by race/ethnicity with decreases of 24.0% for Asian, 17.1% for Black and 16.4% for Latinx female residents. There was no change in the birth rate among White female residents.
- A total of 6,788 **live births** were registered in Boston in 2021, down by 2.5% from 2020. Most births in Boston were among White residents (42.1%), followed by Latinx (25.1%), Black (21.4%) and Asian (8.9%) residents.
    - Of all births in Boston, most were to mothers ages 30-34 (41.3%).
    - A majority of births were to mothers with some college education (75.8%).
    - Most births were to mothers who were English speakers (87.6%).

Low Birthweight Births:

- In Boston, in 2021, 8.4% or 1 in 12 newborns were **low birthweight** (born weighing less than 2,500 grams). For comparison, 8.5% and 7.5% of births in the US and Massachusetts, respectively, were low birthweight.
- There were striking disparities in birthweight by race. In 2021, the percentage of Black infants that were **low birthweight** (13.4%) was twice the rate of White infants (6.2%).
- At 11.8% and 11.3%, the rates of **low birthweight** births were higher in Mattapan and Dorchester (02121, 02125), respectively, compared with the rest of Boston. In contrast, low birthweight births were lower in Back Bay (6.2%), Charlestown (6.2%), South End (6.4%), South Boston (6.7%), and Jamaica Plain (6.9%) compared with the rest of Boston.

Preterm Births:

- From 2017-2021, there was a significant decrease (7.1%) in **preterm births** (born before 37 weeks of gestational age) for Boston overall. Decreased preterm birth was noted among Asian, Latinx, and White residents, however only the change among White residents was

significant. In contrast, there was a non-significant increase in preterm births among Black residents.

- In 2021, 9.2% of Boston births were preterm. The percentage of births that were preterm among Black residents (13.8%) was almost twice that of White residents (7.1%). For comparison, 10.5% and 9.0% of births in the US and Massachusetts, respectively, were preterm. The target set by Healthy People 2030 is 9.4%.

The adolescent birth rate:

- In Boston, similar to the national trend between 2017 and 2021, the birth rate of female residents ages 15-17 decreased significantly. The largest decrease was among female Latinx residents ages 15-17.

Infant Mortality:

- In 2021, the **infant mortality rate** for Boston was 4.6 deaths per 1,000 live births. For comparison, the US and Massachusetts rates were 5.4 and 3.2 deaths per 1,000 live births, respectively, and the goal of Healthy People 2030 is to reduce the rate of infant deaths to 5.0 per 1,000 live births.
- Between 2017 and 2021, the rate of death among Black infants was almost 4 times that of White infants. In 2021, the rate for Black infants (9.7) was over three-times the rate for White infants (3.2).
- Between 2012 and 2021, the **infant mortality rates** in Dorchester and Hyde Park were higher compared with the rest of Boston. In contrast, infant mortality rates in Roslindale and Back Bay were lower compared with the rest of Boston.
- There was a greater than three-fold difference in **infant mortality** between Hyde Park, the neighborhood with the highest infant mortality rate, and the adjacent neighborhood of Roslindale, the neighborhood with the lowest infant mortality rate.

Breastfeeding:

- Intent to breastfeed among Boston mothers was high (greater than 90%), and there were no significant differences among racial or ethnic groups.

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Introduction

Based on guidance from the National Institutes of Health this report uses "women", "mother", "maternal", and other gendered terms to describe the health behaviors, health status, and health outcomes of people who experience pregnancy and give birth. BPHC recognizes this population to be inclusive of cis-gender, transgender, gender-diverse, and non-binary persons.

Birth rates, infant mortality rates (IMR), birth weight, and gestational age serve as key markers for measuring the well-being of pregnant women and infants, and are often used to gauge social, economic, and health system progress. Pregnancy and birth-related complications are serious public health issues in the US, especially maternal morbidity and mortality. The national Healthy People 2030 goals, developed by the US Department of Health and Human Services, that target improvements in pregnancy and birth outcomes are included throughout this report to gauge Boston's progress.

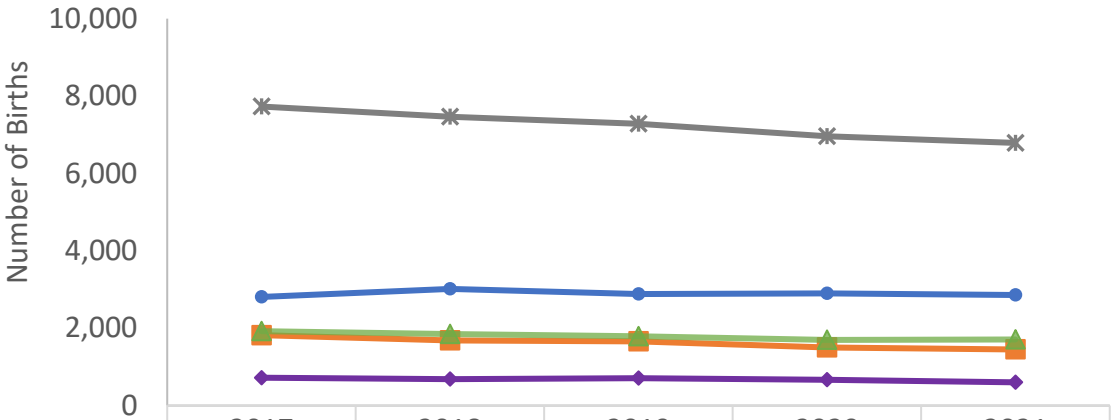
Populations at Risk for Poor Birth Outcomes

The US has inferior birth outcomes compared to other high-income countries (1) and in general, pregnant women in the US are more likely to experience complications than those in other developed nations. Greater maternal age, high risk health behaviors (e.g., smoking during pregnancy), underlying physical and mental health conditions, and genetics have been associated with poor birth outcomes (2). Structural barriers and inequities across the social determinants of health including poor access to housing, healthcare, and nutrition also create challenges for pregnancy and have negative impacts on birthing outcomes.

Recognizing the role that socioeconomic factors play in driving maternal and child morbidity and mortality, it is important to acknowledge that the interactions between race, ethnicity and socioeconomic status are significantly shaped by structural racism and discrimination. One study found that low birthweight and preterm birth rates for infants of Black women in the highest income bracket were significantly higher compared to White women in the lowest income bracket (3). These findings suggest that higher socioeconomic status is not a protective factor against the impacts of racism. Implicit bias within the health care system also contributes to racial/ethnic differences in birth outcomes. Among women with low socioeconomic status, 27% of women of color reported experiencing mistreatment during childbirth compared to 19% of White women (4). Throughout this chapter we note racial disparities in birth outcomes and identify populations at risk of pregnancy-related complications. For more information about Maternal and Infant health please go to page 27 of this report.

SECTION 1. BIRTH COUNTS AND BIRTH RATES

Figure 1. Birth Count† by Race/Ethnicity of Mother and Year, 2017-2021



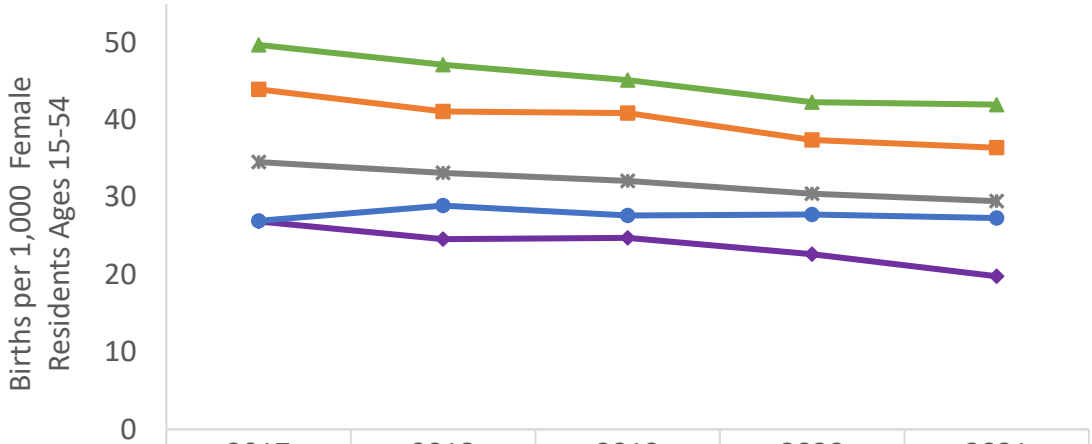
	2017	2018	2019	2020	2021
Boston	7,728	7,468	7,283	6,961	6,788
Asian	720	681	707	667	601
Black	1,820	1,683	1,660	1,505	1,450
Latinx	1,923	1,846	1,791	1,697	1,705
White	2,808	3,015	2,885	2,901	2,856

†The annual birth count is the number of live births per year.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: In Boston, the annual birth count has declined steadily from 7,728 in 2017 to 6,788 in 2021; a 12% decrease (**Figure 1**). Decreases were noted among Asian, Black, and Latinx residents, while the birth count among White residents remained stable over time.

2021: There were 6,788 births in Boston overall comprised of 601 Asian, 1,450 Black, 1,705 Latinx, and 2,856 White resident births.

Figure 2. Birth Rate† by Race/Ethnicity of Mother and Year, 2017-2021



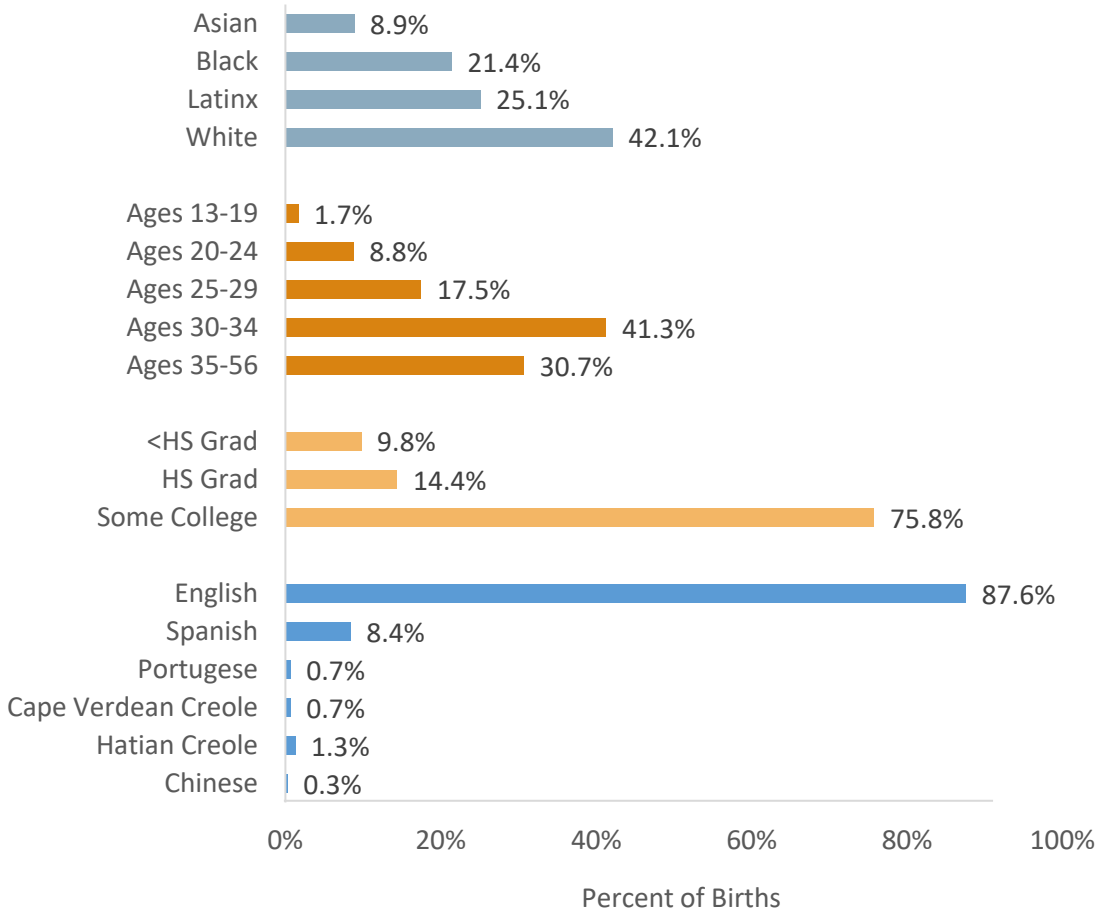
	2017	2018	2019	2020	2021
Boston	34.5	33.2	32.1	30.5	29.5
Asian	26.9	24.6	24.8	22.6	19.8
Black	43.9	41.1	40.9	37.4	36.4
Latinx	49.7	47.1	45.1	42.3	42.0
White	27.0	28.9	27.6	27.8	27.3

† Rate per 1,000 female residents
A test for linear trends was used to compare birth rates over time.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: The birth rate (births per 1,000 female residents) decreased by 14.8% for Boston overall. Specifically, the birth rate decreased by 24.0% for Asian, 17.1% for Black, and 16.4% for Latinx female residents. There was no decline in the birth rate of White female residents (**Figure 2**).

2021: There were 29.5 births per 1,000 female Boston residents overall, a decline of 3.3% from 2020.

Figure 3. Births by Selected Indicators of Mother, 2021



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

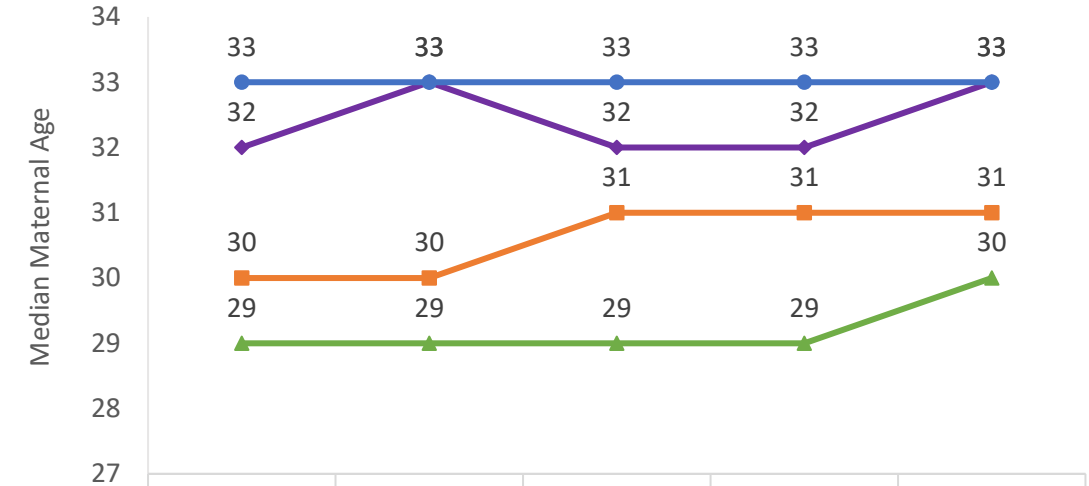
2021: In 2021, 42.1% of births were to White residents and 57.9% were to residents of color (**Figure 3**).

Most births (41.3%) were to residents between the ages 30-34 years of age.

Most women who gave birth in 2021 had some college education (75.8%).

A majority of women who gave birth in 2021 were English speakers (87.6%).

Figure 4. Births by Median Maternal Age by Race/Ethnicity and Year, 2017-2021



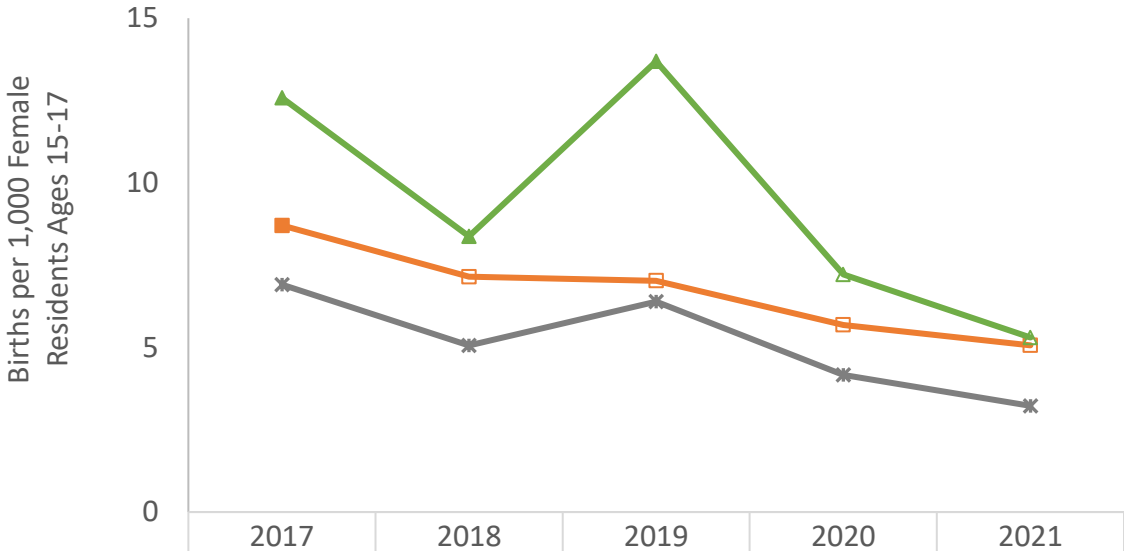
	2017	2018	2019	2020	2021
Asian	32	33	32	32	33
Black	30	30	31	31	31
Latinx	29	29	29	29	30
White	33	33	33	33	33

DATA SOURCE: Boston Live Births, Massachusetts Department of Public Health

2017-2021: The median maternal age across Boston remained stable across race/ethnicity (**Figure 4**).

2021: The median maternal age for White and Asian mothers was 33 years. Black mothers had a median maternal age of 31 years and Latinx mothers a median maternal age of 30 years.

Figure 5. Birth Rate† among Females Ages 15-17 by Race/Ethnicity and Year, 2017-2021



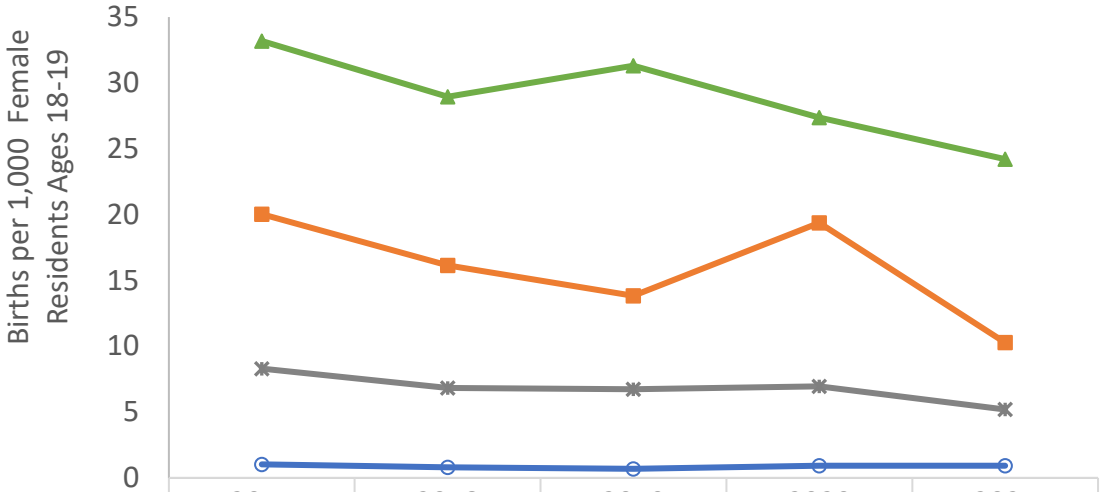
	2017	2018	2019	2020	2021
Boston	6.9	5.1	6.4	4.2	3.2
Black	8.7	7.1	7.0	5.7	5.1
Latinx	12.6	8.4	13.7	7.2	5.3

† Rate per 1,000 female residents ages 15-17
NOTE: Rates for Asian and White residents not presented due to small number of births (n<5); Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution. Significant decreases and increases are determined by assessing linear change across the entire 5-year time period.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: Like the national trend (5), in Boston between 2017 to 2021, the birth rate of female residents ages 15-17 decreased significantly by 47.7% (**Figure 5**). There was a significant decrease of 49.1% in the birth rate for Latinx female residents.

2021: There were 3.2 births per 1,000 female residents ages 15-17 for Boston overall. Although not a direct comparison, it is interesting to note that in the US in 2021 there was a record low of 13.9 pregnancies per 1,000 females ages 15-19 and in Massachusetts this rate was 5.7 (6, 7). The target set by Healthy People 2030 is 31.4 pregnancies per 1,000 females of the 15-19 age group (8).

Figure 6. Birth Rate† Among Females Ages 18-19 by Race/Ethnicity and Year, 2017-2021



	2017	2018	2019	2020	2021
Boston	8.3	6.8	6.7	7.0	5.2
Black	20.0	16.1	13.8	19.4	10.3
Latinx	33.2	28.9	31.3	27.4	24.2
White	1.0	0.8	0.7	0.9	0.9

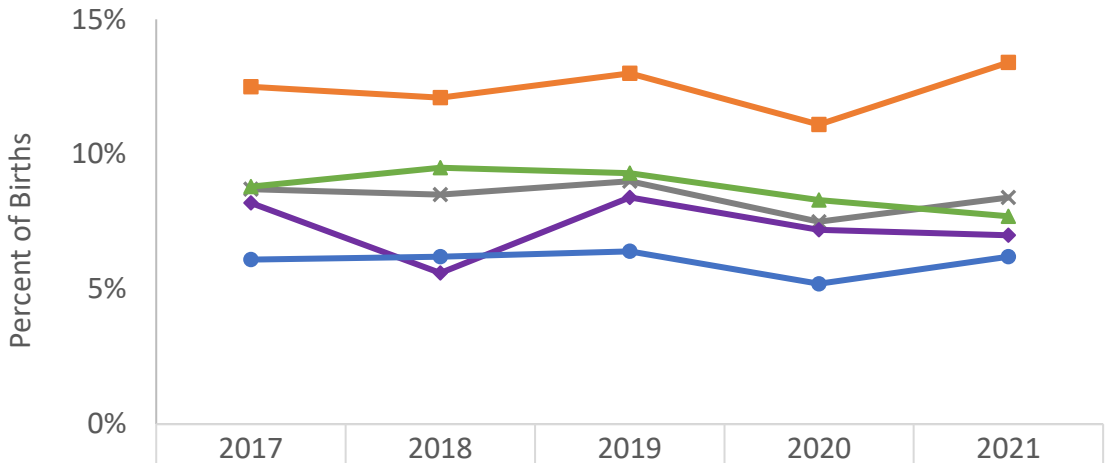
† Rate per 1,000 female residents ages 18-19
NOTE: Rates for Asian and White residents not presented due to small number of births (n<5)
Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: The birth rate of females ages 18-19 decreased by 30.2% in Boston overall (**Figure 6**).

2021: There were 5.2 births per 1,000 residents among females ages 18-19 in Boston overall. The target set by Healthy People 2030 is 31.4 pregnancies per 1,000 females of the 15-19 age group (8).

SECTION 2. LOW BIRTHWEIGHT

Figure 7. Low Birthweight Births† by Race/Ethnicity of Mother and Year, 2017-2021



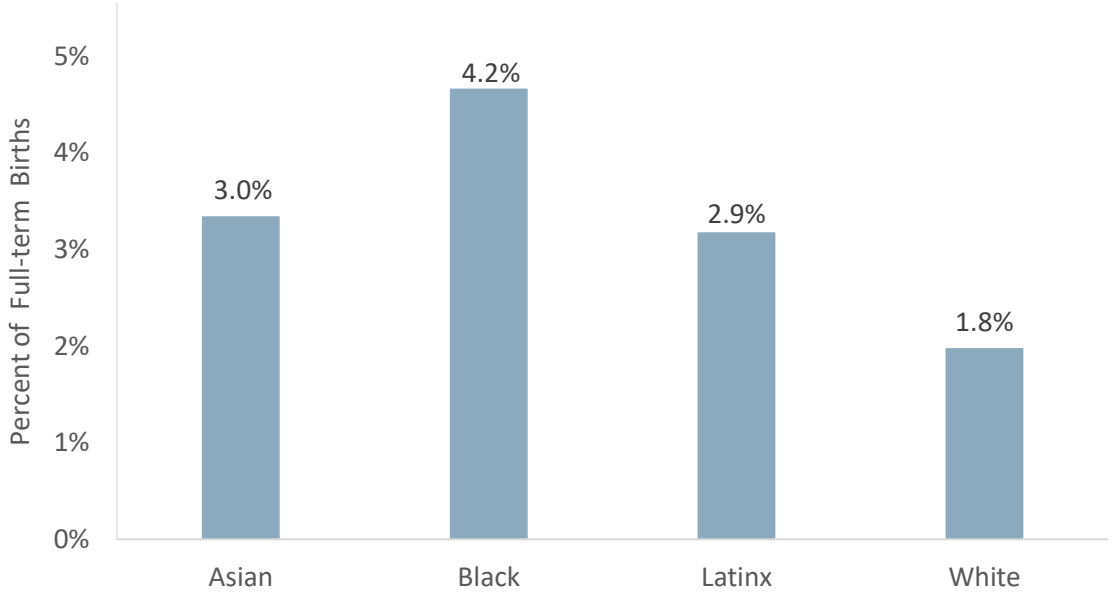
	2017	2018	2019	2020	2021
Boston	8.7	8.5	9.0	7.5	8.4
Asian	8.2	5.6	8.4	7.2	7.0
Black	12.5	12.1	13.0	11.1	13.4
Latinx	8.8	9.5	9.3	8.3	7.7
White	6.1	6.2	6.4	5.2	6.2

†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: Although low birthweight births were stable in Boston overall, there were striking disparities by race/ethnicity (**Figure 7**). Across this time period, there were approximately twice as many low birthweight births among Black residents compared to White residents.

2021: In 2021, 8.4% of Boston births were low birthweight. For comparison, 8.5% of births in the US and 7.5% of births in Massachusetts were low birthweight (9, 10). The percentages of births that were low birthweight for Latinx (7.7%) residents was higher compared with White residents (6.2%) and Black residents (13.4%) had twice the rate of White residents.

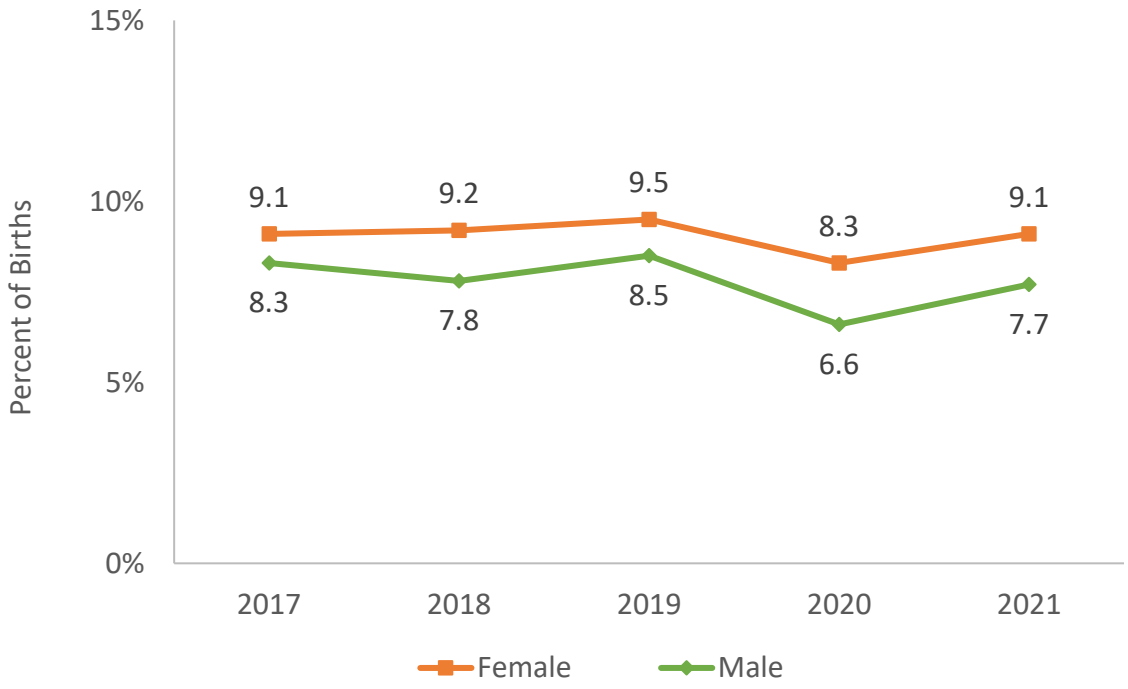
Figure 8. Full-term Low Birthweight Births† Among All Births by Maternal Race/Ethnicity, 2017-2021 Combined



†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among full-term (40 gestational weeks) births.
DATA SOURCE: Boston Live Births, Massachusetts Department of Public Health

2017-2021 combined: The percent of full-term low birthweight births among Black residents (4.2%) was more than twice that of White residents (1.8%), (Figure 8). The percent of full-term low birthweight births among Asian (3.0%) and Latinx (2.9%) residents was also higher than among White mothers (1.8%), (**Figure 8**).

Figure 9. Low Birthweight Births† by Sex of Infant and Year, 2017-2021

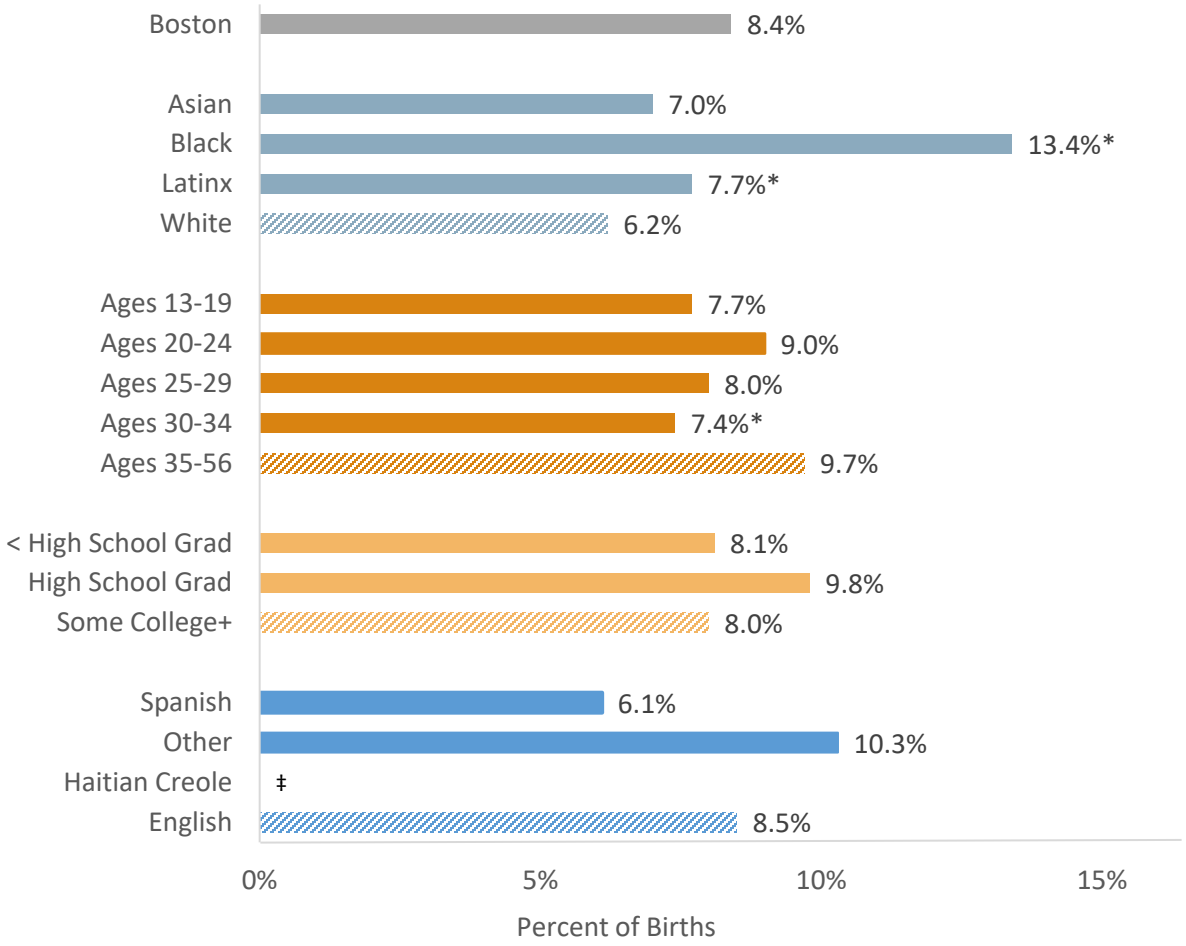


†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: The percentage of low birthweight births among male and female infants was stable between 2017-2021 with a consistently higher percent of female compared to male low birthweight infants (**Figure 9**).

2021: 9.1% of female infants and 7.7% of male infants had a low birthweight.

Figure 10. Low Birthweight Births† by Selected Indicators of Mother, 2021

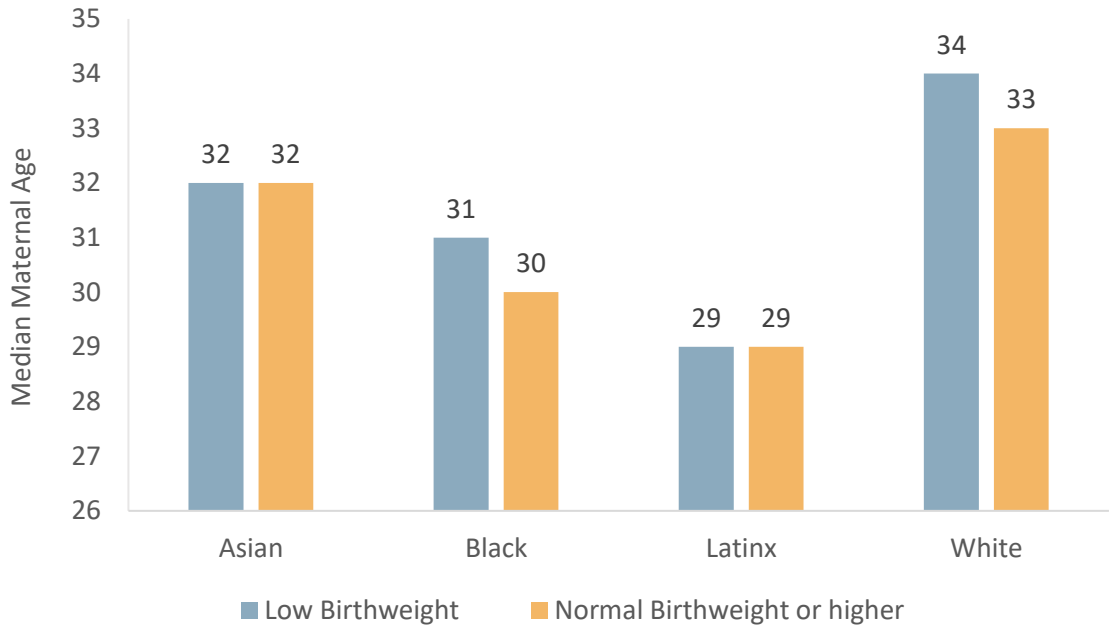


†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.
‡ Rates not presented due to small number of cases
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2021: In Boston, 8.4%, or 1 in 12, infants were low birthweight (**Figure 10**, also see Figure 7). The percentages of births that were low birthweight for Black (13.4%) and Latinx (7.7%) residents were significantly higher compared with White residents (6.2%). Strikingly, the low birthweight percentage among Black residents was more than twice that of White residents.

Residents ages 35-56 had the highest percentage of births that were low birthweight (9.7%).

Figure 11. Median Maternal Age by Race/Ethnicity and Birthweight†, 2017-2021 Combined



†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.

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

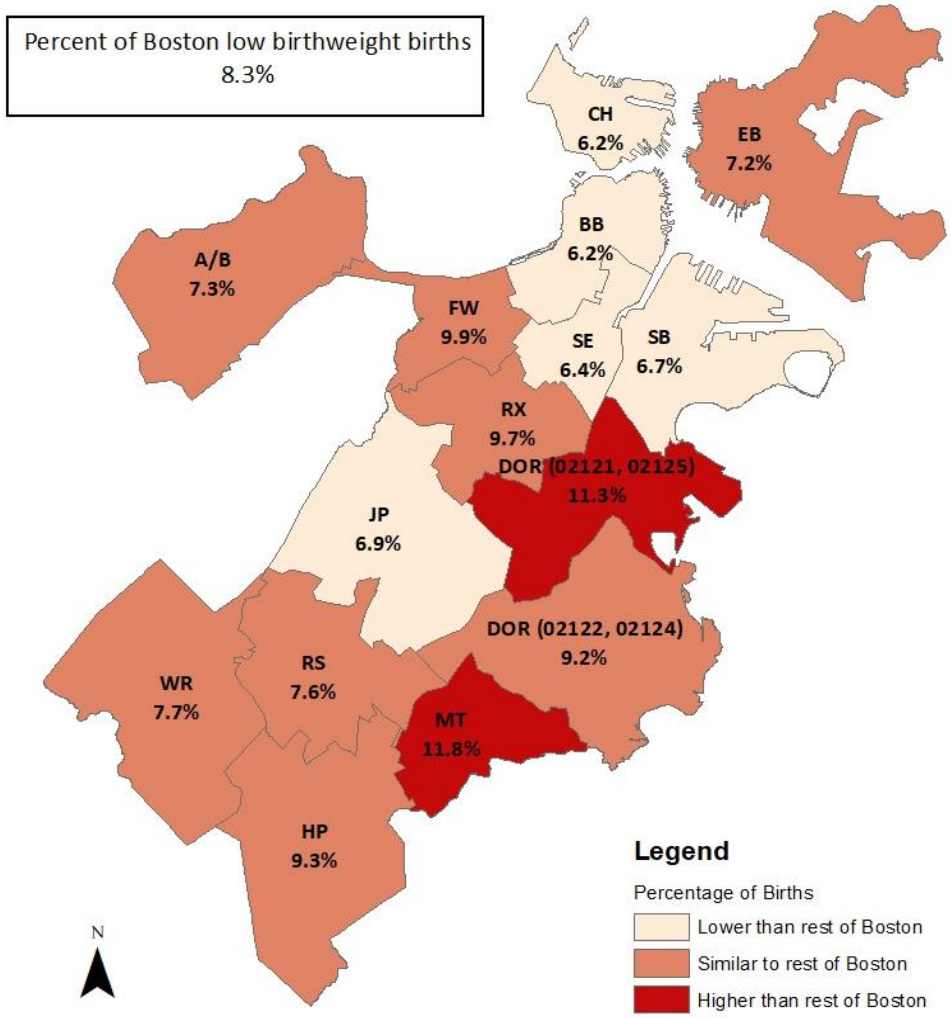
2017-2021 combined: The median maternal age for low and normal birthweight births was similar for each race/ethnicity group (**Figure 11**, see also Figure 4).

Latinx residents had the youngest median maternal age of 29 years for both low and normal birthweight births.

The median maternal age among Asian residents was 32 years for both low and normal birthweight births. Similarly, the median maternal age for low and normal birthweight births was 31 and 30 years respectively for Black residents.

White residents had the oldest median maternal ages of 34 and 33 years for low and normal birthweight births, respectively.

Figure 12. Low Birthweight Births† by Neighborhood, 2019, 2020 and 2021 Combined



†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.

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

2019, 2020, and 2021 combined: The percentage of births that were low birthweight for Boston overall was 8.3%. At 11.8% and 11.3%, the rates of low birthweight births were higher in Mattapan and Dorchester (02121, 02125), respectively, compared with the rest of Boston (**Figure 12** and **Table 1**). In contrast, the percentages of births that were low birthweight were lower in Back Bay (6.2%), Charlestown (6.2%), South End (6.4%), South Boston (6.7%), and Jamaica Plain (6.9%) compared with the rest of Boston.

Table 1. Low Birthweight Births† by Neighborhood, 2019, 2020, and 2021 Combined, Ranked in Descending Order

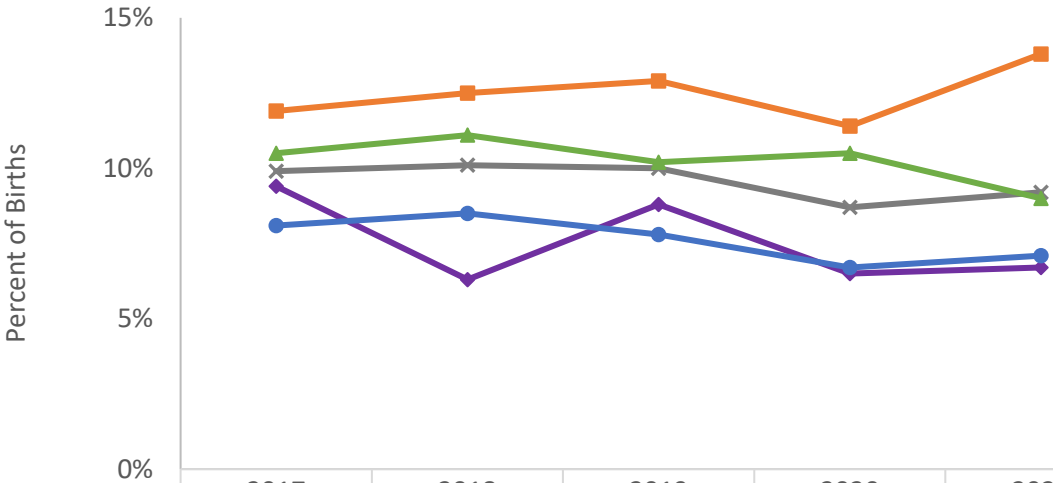
Neighborhood	Percent of Births
Mattapan (MT), 02126	11.8%
Dorchester (DOR), 02121, 02125	11.3%
Fenway (FW), 02115, 02215	9.9%
Roxbury (RX), 02119, 02120	9.7%
Hyde Park (HP), 02136	9.3%
Dorchester (DOR) 02122, 02124	9.2%
West Roxbury (WR), 02132	7.7%
Roslindale (RS), 02131	7.6%
Allston/Brighton (AB), 02134, 02135, 02163	7.3%
East Boston (EB), 02128	7.2%
Jamaica Plain (JP), 02130	6.9%
South Boston (SB), 02127, 02210	6.7%
South End (SE), 02111, 02118	6.4%
Charlestown (CH), 02129	6.2%
Back Bay, Downtown, Beacon Hill, North End, West End (BB), 02108-02110, 02113-02114, 02116, 02199	6.2%

†Low birthweight is defined as less than 2,500 grams or 5.5 pounds. Here we report low birthweight births among all births.

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

SECTION 3. PRETERM BIRTHS

Figure 13. Preterm Births† by Race/Ethnicity of Mother and Year, 2017-2021



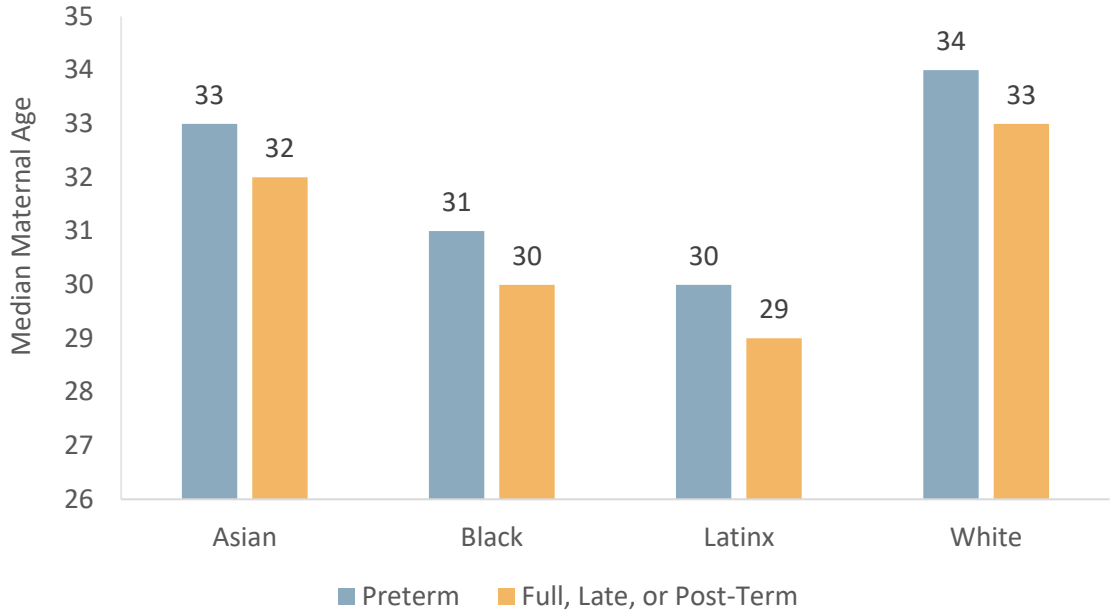
	2017	2018	2019	2020	2021
Boston	9.9	10.1	10.0	8.7	9.2
Asian	9.4	6.3	8.8	6.5	6.7
Black	11.9	12.5	12.9	11.4	13.8
Latinx	10.5	11.1	10.2	10.5	9.0
White	8.1	8.5	7.8	6.7	7.1

†Preterm births refer to infants born prior to 37 weeks gestational age.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017-2021: There was a significant decrease in the percentages of births that were preterm among White residents and Boston overall from 2017-2021 (**Figure 13**). From 2020-2021, there was a 22% increase in the percentage of births that were preterm among Black residents, but this increase was not found to be statistically significant (p=.07)

2021: 9.2% of births were preterm among Boston residents. For comparison, 10.5% of births in the US and 9.0% of births in Massachusetts were preterm (9, 11). Note, the national target set by Healthy People 2030 is 9.4% (8). The percentage of births that were preterm for Black residents (13.8%) was almost twice that of White residents (7.1%). The percent of births that were preterm for Latinx residents (9.0%) was significantly higher compared to White residents.

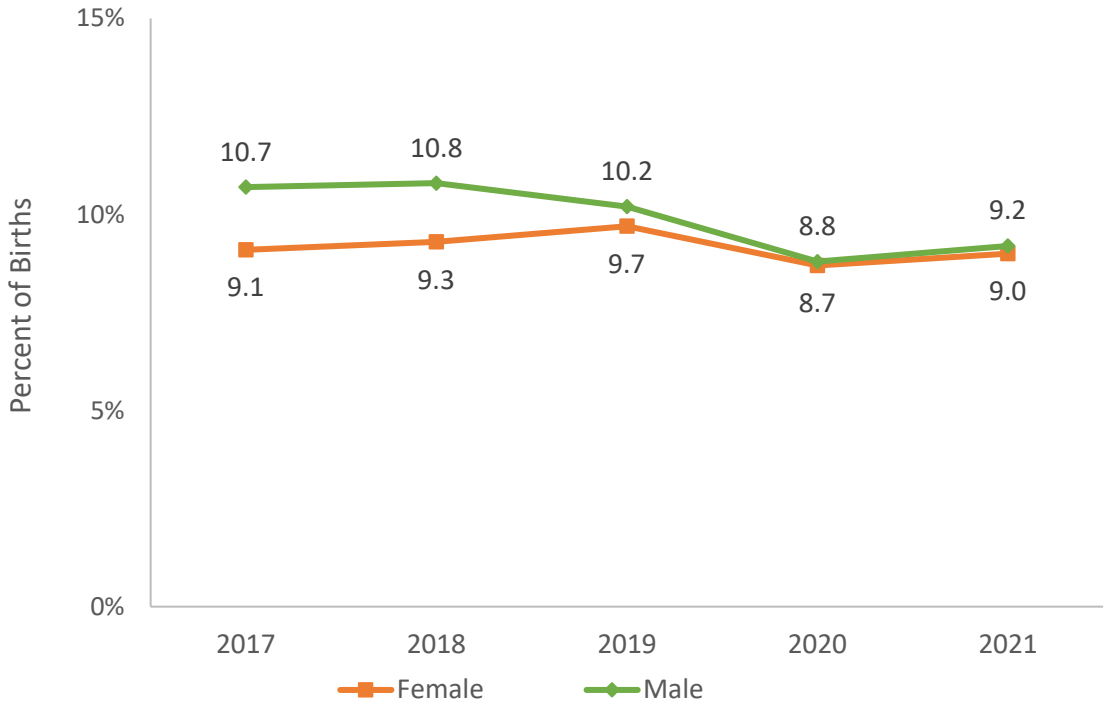
Figure 14. Median Maternal Age by Race/Ethnicity and Preterm† Birth, 2017-2021 Combined



†Preterm births occur prior to 37 weeks gestational age.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017- 2021: The median age for preterm births was consistently 1 year higher than the median age for full, late or post-term births (**Figure 14**). The median maternal age for preterm births was highest for White (34 years) followed by Asian (33 years), and Black (31), then Latinx (30) residents.

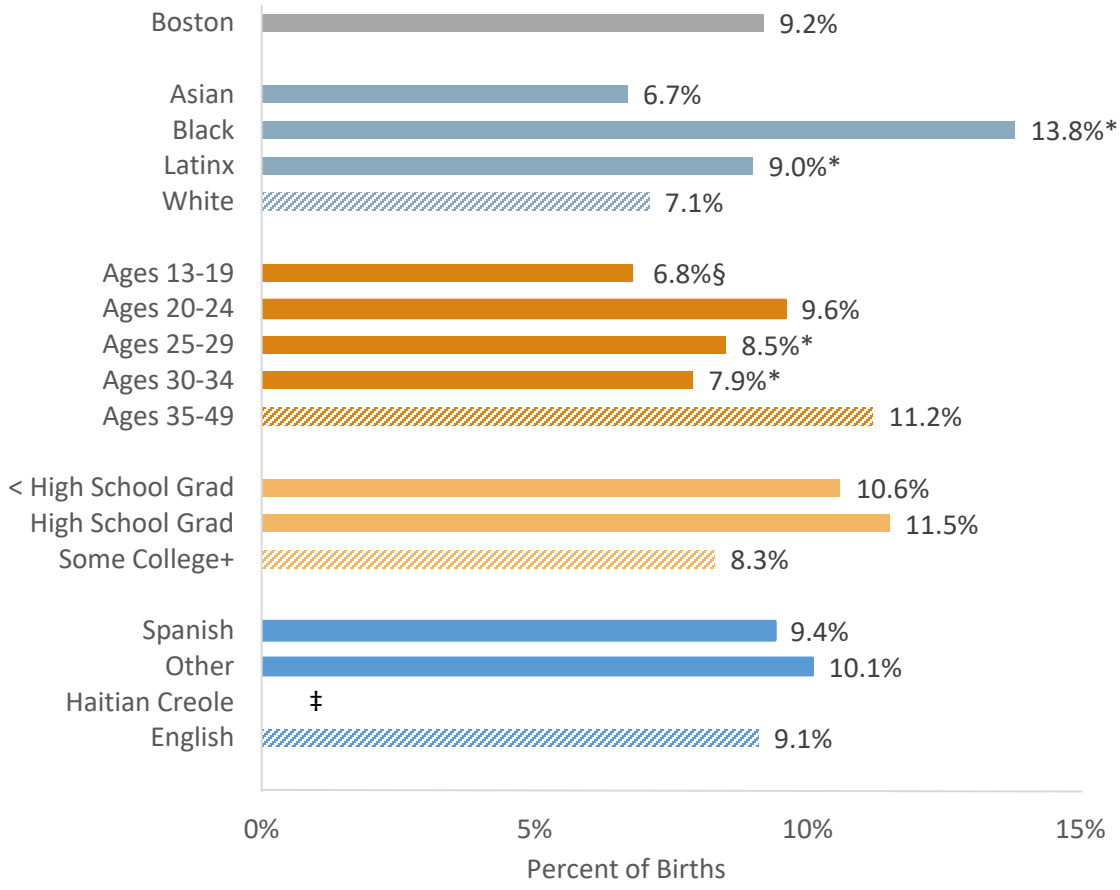
Figure 15. Preterm Births† by Sex of Infant and Year, 2017-2021



†Preterm births occur prior to 37 weeks gestational age.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2017- 2021: In 2017, there was a higher rate of male infants (10.7%) compared to female infants (9.1%) born preterm (**Figure 15**). However, by 2021, this gap closed with no difference among male (9.2%) and female (9.0%) infants in the rate of preterm birth.

Figure 16. Preterm Births† by Selected Indicators, 2021



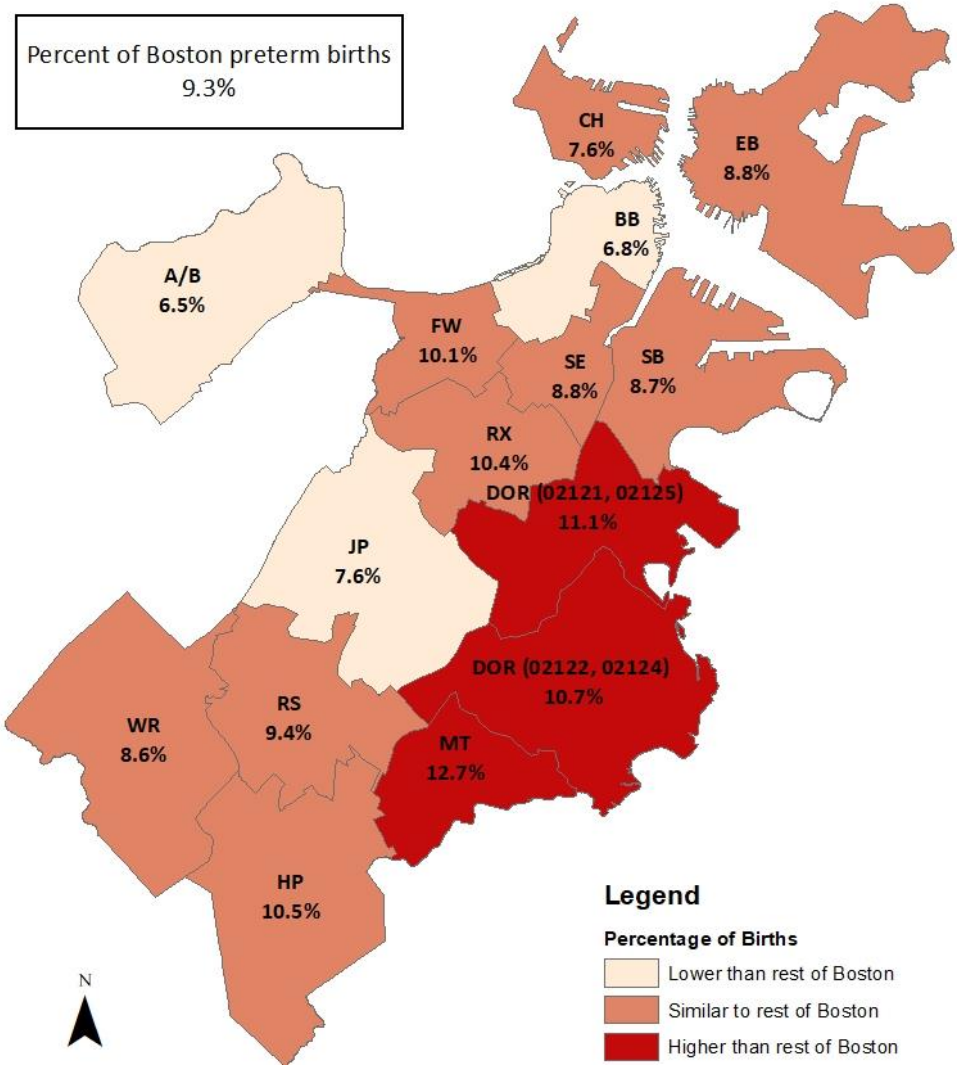
†Preterm births occur prior to 37 weeks gestational age.
‡ Rates not presented due to small number of cases (n<5)
§ Rates based on 20 or fewer cases and should be interpreted with caution
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2021: 9.2% of Boston births were preterm (**Figure 16**).

The percentages of births that were preterm for Black (13.8%), and Latinx (9.0%) residents were higher compared to that of White residents (7.1%), (**Figure 16**, also see Figure 13). The percentages of births that were preterm for residents ages 25-29 (8.5%) and residents ages 30-34 (7.9%) were lower compared to residents ages 35-49 (11.2%).

The percentages of births that were preterm for residents who received a high school education (11.5%) were higher compared to residents who received at least some college education (8.3%).

Figure 17. Preterm Births† by Neighborhood, 2019, 2020 and 2021 Combined



†Preterm births occur prior to 37 weeks gestational age.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

2019, 2020 and 2021 combined: The rates of births that were preterm were higher in Dorchester (02121, 02125) (11.1%), Dorchester (02122,02124) (10.7%), and Mattapan (12.7%) compared with the rest of Boston (**Figure 17** and **Table 2**). In contrast, the percentage of births that were preterm were lower in Allston/Brighton (6.5%), Back Bay (6.8%), and Jamaica Plain (7.6%) compared with the rest of Boston.

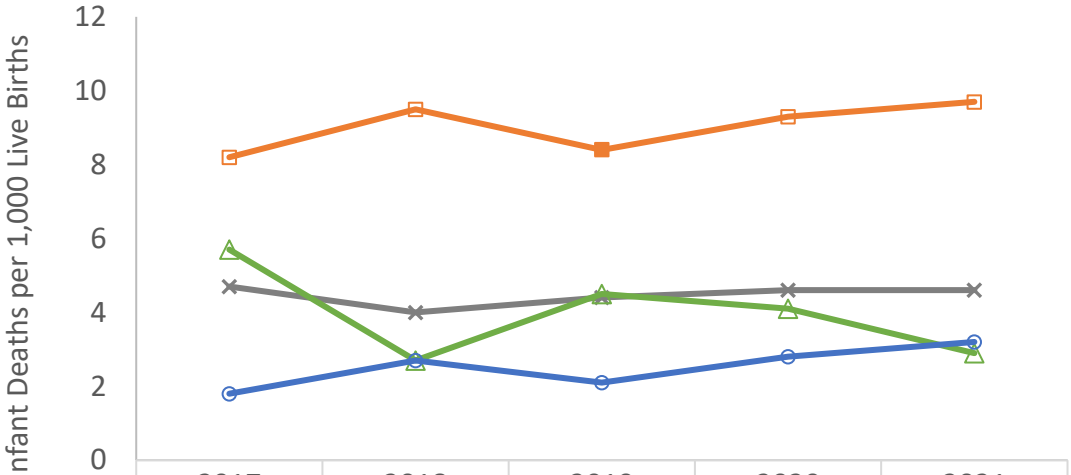
Table 2. Preterm Births† by Neighborhood, 2019, 2020 and 2021 Combined, Ranked in Descending Order

Neighborhood	Percent of Births
Mattapan (MT), 02126	12.7%
Dorchester (DOR), 02121, 02125	11.1%
Dorchester (DOR) 02122, 02124	10.7%
Hyde Park (HP), 02136	10.5%
Roxbury (RX), 02119, 02120	10.4%
Fenway (FW), 02115, 02215	10.1%
Roslindale (RS), 02131	9.4%
East Boston (EB), 02128	8.8%
South End (SE), 02111, 02118	8.8%
South Boston (SB), 02127, 02210	8.7%
West Roxbury (WR), 02132	8.6%
Jamaica Plain (JP), 02130	7.6%
Charlestown (CH), 02129	7.6%
Back Bay, Downtown, Beacon Hill, North End, West End (BB), 02108-02110, 02113-02114, 02116, 02199	6.8%
Allston/Brighton (AB), 02134, 02135, 02163	6.5%

†Preterm births occur prior to 37 weeks gestational age.
DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

SECTION 4. INFANT MORTALITY

Figure 18. Infant Mortality† by Maternal Race/Ethnicity and Year, 2017-2021



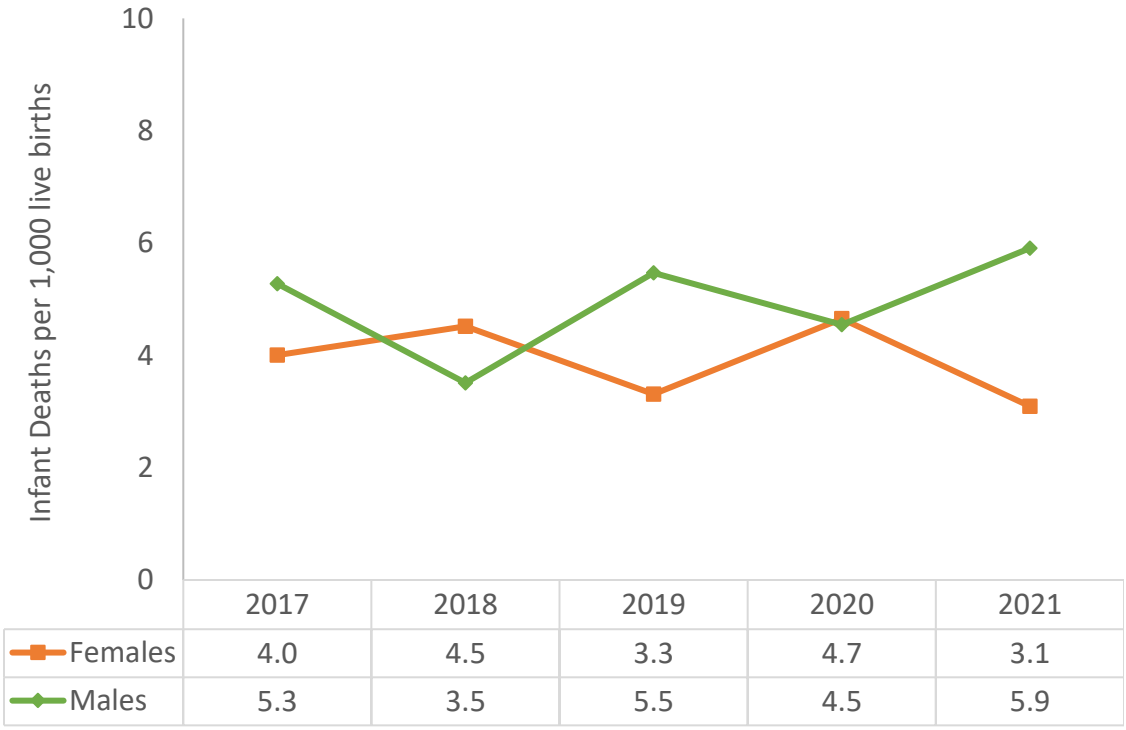
	2017	2018	2019	2020	2021
Boston	4.7	4.0	4.4	4.6	4.6
Black	8.2	9.5	8.4	9.3	9.7
Latinx	5.7	2.7	4.5	4.1	2.9
White	1.8	2.7	2.1	2.8	3.2

†Infant mortality is presented as the rate of infant deaths per 1,000 live births.
NOTE: Rates are not presented due to a small number of cases for Asian infants; Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution
DATA SOURCE: Boston live births, Massachusetts Department of Public Health; Boston resident deaths, Massachusetts Department of Public Health

2017-2021: Although there was no significant change in the rate of infant deaths in Boston over time, there were significant differences in the rates by race/ethnicity.

2021: The infant mortality rate for Boston was 4.6 deaths per 1,000 live births. For comparison, the US and Massachusetts rates were 5.4 and 3.2 deaths per 1,000 live births, respectively (12). The rate for Black infants (9.7) was more than three times higher than the rate for White infants (3.2). The Healthy People 2030 target for infant mortality is 5.0 infant deaths per 1,000 live births (8).

Figure 19. Infant Mortality† by Sex and Year, 2017-2021



	2017	2018	2019	2020	2021
Females	4.0	4.5	3.3	4.7	3.1
Males	5.3	3.5	5.5	4.5	5.9

†Infant mortality is presented as the rate of infant deaths per 1,000 live births.
DATA SOURCE: Boston live births, Massachusetts Department of Public Health; Boston resident deaths, Massachusetts Department of Public Health

2017-2021: There was no significant change in the infant mortality rate among male and female infants.

2021: The infant mortality rate for female infants was 3.1 deaths per 1,000 live births and for male infants it was 5.9 deaths per 1,000 live births.

Table 3. Infant Mortality by Cause of Death and Race/Ethnicity of Infant, 2017-2021 Combined

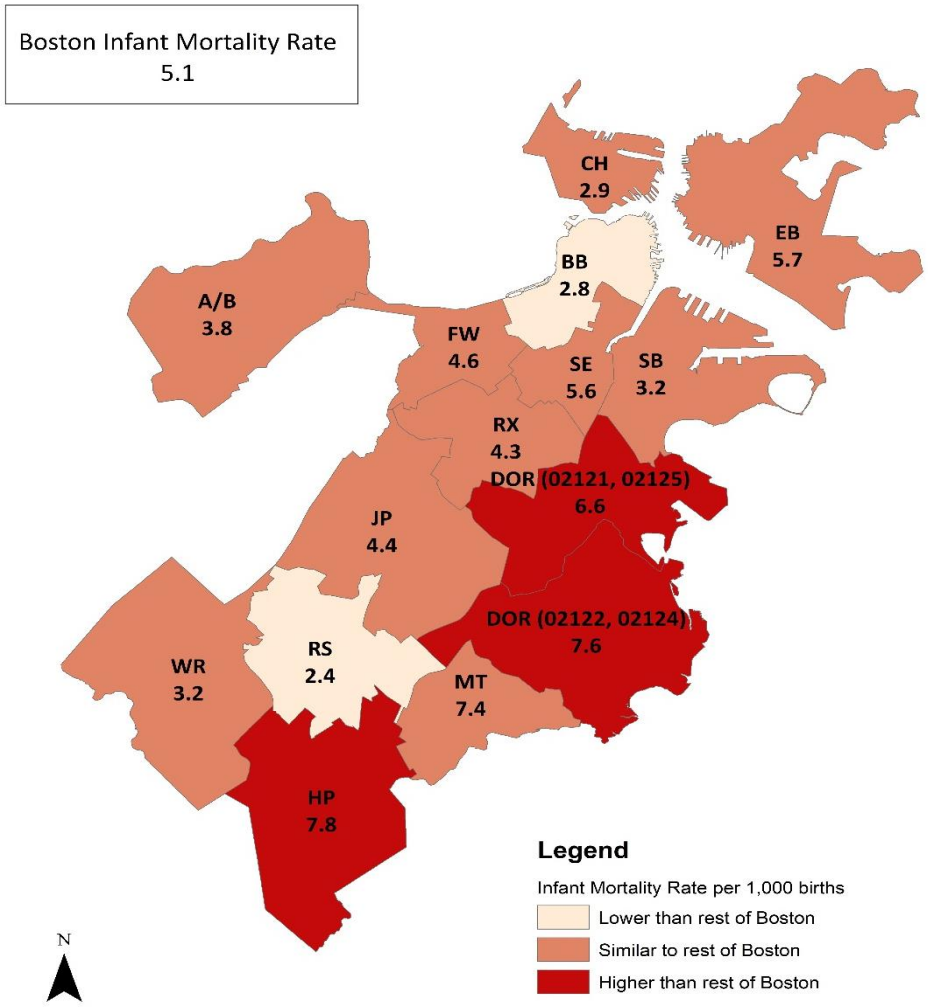
	Boston		Asian		Black		Latinx		White	
	(Live births = 36,228)		(Live births = 3,376)		(Live births = 8,118)		(Live births = 8,962)		(Live births = 14,465)	
Cause	**Deaths**	**IMR†**	**Deaths**	**IMR†**	**Deaths**	**IMR†**	**Deaths**	**IMR†**	**Deaths**	**IMR†**
Perinatal	97 (60%)	2.7	n<5	n/a	48 (66%)	5.9	23 (64%)	2.6	17 (47%)	1.2§
Congenital	29 (18%)	0.8	n<5	n/a	8 (11%)	1.0§	6 (17%)	0.7§	10 (28%)	0.7§
Other*	35 (22%)	0.7	n<5	n/a	17 (23%)	1.5§	7 (19%)	0.9§	9 (27%)	0.6§
Total	**161**	**4.4**	**7**	**2.1§**	**73**	**9.0**	**36**	**4.0**	**36**	**2.5**

†Infant mortality rate (IMR) is the rate of infant deaths per 1,000 live births.
§ Rates based on 20 or fewer cases and should be interpreted with caution
*Other includes sudden infant death syndrome (SIDS)
DATA SOURCE: Boston live births, Massachusetts Department of Public Health; Boston resident deaths, Massachusetts Department of Public Health

2017-2021 combined: Perinatal conditions were the most common cause of infant death in Boston overall (60%) and for all racial/ethnic groups. Perinatal conditions include deaths due to complications of pregnancy, labor, and delivery, disorders related to the length of gestation and fetal growth, birth trauma, resipratory and cardiovascular disorders specific to the perinatal period, and infections specific to the perinatal period.

For Boston overall, the second most common cause of death was congenital abnormalities (18%).

Figure 20. Infant Mortality† by Neighborhood, 2012-2021 Combined*



†Infant mortality is presented as the rate of infant deaths per 1,000 live births.
*Ten years of data were combined (2012-2021) in order to increase statistical power.
NOTE: Shading in map based on significant differences between neighborhood percentage and rest of Boston. Thus, Mattapan has a higher infant mortality rate (7.4) than Dorchester (02121, 02125) (6.6) but is considered "similar to the rest of Boston".
DATA SOURCE: Boston live births, Massachusetts Department of Public Health; Boston resident deaths, Massachusetts Department of Public Health

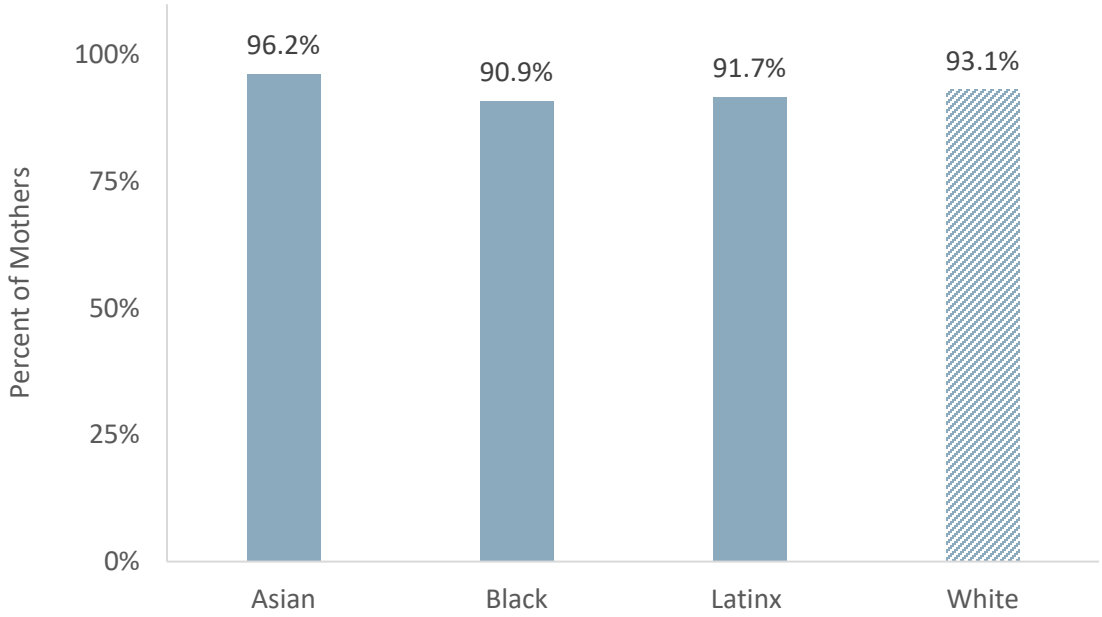
2012-2021 combined: The infant mortality rates in Hyde Park (7.8%) Dorchester (02122, 02124) (7.6) and Dorchester (02121, 02125 (6.6), were higher compared with the rest of Boston (**Figure 20** and **Table 4**). In contrast, infant mortality rates in Roslindale (2.4) and Back Bay (2.8) were lower compared with the rest of Boston. There was a greater than three-fold difference between infant mortality between Hyde Park, the neighborhood with the highest infant mortality, and the adjacent neighborhood of Roslindale which had the lowest infant mortality.

Table 4. Infant Mortality† Rate by Neighborhood, 2012-2021 Combined, Ranked in Descending Order*

Neighborhood	Rate per 1,000 Live Births
Hyde Park (HP), 02136	7.8
Dorchester (DOR) 02122, 02124	7.6
Mattapan (MT), 02126	7.4
Dorchester (DOR) 02121, 02125	6.6
East Boston (EB), 02128	5.7
South End (SE), 02111, 02118	5.6
Fenway (FW), 02115, 02215	4.6
Jamaica Plain (JP), 02130	4.4
Roxbury (RX), 02119, 02120	4.3
Allston/Brighton (AB), 02134, 02135, 02163	3.8
South Boston (SB), 02127, 02210	3.2
West Roxbury (WR), 02132	3.2
Charlestown (CH), 02129	2.9
Back Bay, Downtown, Beacon Hill, North End, West End (BB), 02108-02110, 02113-02114, 02116, 02199	2.8
Roslindale (RS), 02131	2.4

†Infant mortality is presented as the rate of infant deaths per 1,000 live births
*Ten years of data were combined (2012-2021) in order to increase statistical power.
DATA SOURCE: Boston live births, Massachusetts Department of Public Health; Boston resident deaths, Massachusetts Department of Public Health

Figure 21. Breastfeeding Initiation at Time of Hospital Discharge by Maternal Race/Ethnicity, 2021



NOTE: Bars with hatch marks indicate the reference group.
DATA SOURCE: Boston live births, Massachusetts Department of Public Health

2021: Intent to breastfeed among Boston mothers was high (all over 90%) and there were no significant differences among the different racial/ethnic groups.

The percent of Asian mothers intended to breastfeed their infant at birth was highest at 96.2%. In contrast, 93.1%, 91.7% and 90.9% of White, Latinx and Black mothers, respectively, intended to breastfeed their infant at birth.

Healthy people 2030 has a goal to increase the proportion of infants that breastfeed at 1 year from 35.9% in 2019 to 54.1% in 2030 (8).

MORE ABOUT MATERNAL AND INFANT HEALTH

Maternal Mortality and Morbidity

Please note that the number of maternal deaths within the city of Boston was too small for analysis.

Data from the Massachusetts Department of Public Health (MDPH) indicated that Black women in Massachusetts are 1.9 times more likely to die during pregnancy or within one-year postpartum compared to White women (13). The prevalence of severe maternal morbidity nearly doubled in Massachusetts from 2011-2020 with Black mothers having the highest rates (14).

Nationally, the maternal mortality rate for 2021 was 32.9 deaths per 100,000 live births, compared with a rate of 23.8 in 2020 and 20.1 in 2019. The rate for Black women was 69.9 deaths per 100,000 live births, 2.6 times the rate for White women (26.6) (15). The increases from 2020 to 2021 for all races were significant.

Infant Mortality

The infant mortality rate (IMR) is the number of infant deaths per 1,000 live births (12). In 2021, the Boston IMR was 4.6 deaths per 1,000 live births. In 2020, the US IMR was 5.4 (12). The US IMR has shown some improvement in recent years; however, the rate is still approximately 71% higher than that of the comparable developed nations (16). Significant disparities also exist within the US. In particular, Southern states, Black persons, American Indian or Alaska Native (AIAN) persons, Native Hawaiian or Other Pacific Islander (NHPI) persons, younger maternal age (under 20, 20-24), and older maternal age (40-64) are associated with higher-than-average IMRs (12, 16).

Teen Birth

The US teen birth rate (births per 1,000 female ages 15-19) has been trending downwards since 1991, and since 2009, the rate has declined to a new low each year (17,18). In 2021, the US teen birth rate was 13.9, a decrease of 10% from 2020 (18, 19). Like IMR, the teen birth rate in the US is higher in comparison to other high-income countries (20).

As of 2020, the rate of teen births in the US was higher among AIAN, NHPI, Latinx, and Black adolescents compared to the overall rate (5). Teen pregnancy and childbearing are associated with higher social and economic costs for teen parents, and children of teenage parents are more likely to have lower educational achievement, higher high school dropout rates, health

problems, be incarcerated during adolescence, face unemployment as an adult, and experience teenage pregnancy when they reach adolescence (18).

Low Birthweight

Newborns weighing less than 2,500 grams (5.5 lbs.), regardless of gestational age, are classified as having low birthweight (9). In 2021, 8.4% of Boston newborns were born low birthweight. This is similar to the US, nationally 8.5% of newborns were born low birth weight, and 1.4% were very low birthweight, less than 1,500 grams (3.3 lbs.). Low birth weight is a key indicator of maternal health, nutrition, access to the healthcare delivery system, and the impact of the social determinants of health such as poverty (21). Low weight infants are at increased risk of various health issues including inability to maintain body temperature, difficulty feeding or gaining weight, breathing problems, neurologic problems, gastrointestinal problems, and infection (22).

Preterm Birth

Infants born before 37 weeks of gestational age are considered preterm (23). Preterm infants are at higher risk of death and disability, as they are more likely to have health issues due to their low birth weight and potential for underdevelopment. In 2021, the US preterm birth rate increased 4% from 2020, with approximately 1 in 10 infants born preterm, considerably higher than other developed nations. In 2021, 9.2% of Boston infants were born preterm.

Certain medical and pregnancy conditions, behavioral factors, socioeconomic factors and age can increase the risk of preterm delivery. Teens and women over age 35, low income, prior preterm birth, infection, carrying more than 1 baby (e.g., twins), tobacco and substance use, and stress are associated with preterm birth (23). In 2019, preterm birth rates were higher for non-Hispanic Black mothers (14.4% of births) when compared with the overall rate (10.2% of births) in the US. (24).

METHODS

This report presents data on birth outcomes (birth rates, teen birth rates, low birthweight, preterm birth, and infant mortality) among Boston residents from 2012 to 2021 derived mainly from two data sources: (1) Boston birth data from the Boston Resident Live Birth files and (2) Boston resident infant mortality data are from the Massachusetts Resident Death files, Massachusetts Department of Public Health.

For Boston comparisons, rate changes over time for the last five years (2017-2021) and rate differences between two demographic groups for the most recent year or time period were assessed. Whether birth outcome rates increased or decreased was determined by assessing linear change across the entire 5-year time period using Poisson regression ($p<.05$).

Similarly, a rate for a given demographic group is described as higher or lower than the comparison group (i.e., reference group) only when the comparison test indicated statistical significance. When two rates were compared and the difference was not found to be statistically significant, the two rates are described as "similar" if mentioned in text.

Demographic group differences for birth outcomes were based on a comparison of single-year rates for the most recent data year, 2021.

Boston population data used as denominators in the rate calculations were produced internally by the BPHC Population Health and Research Boston Population Estimates Project (B-PEP). BPEP uses 2010 and 2020 US Census data and 2019 American Community Survey (ACS) data for Boston to generate population estimates for years between the 2010 and 2020 censuses via interpolation and extrapolation of age, race/ethnicity, sex, and neighborhood population change from 2010 to 2020. For more information on B-PEP, please contact the BPHC Population. Of note, B-PEP population estimates will be revised as the US Census Bureau releases further detailed 2020 population data.

For analytical purposes, infants are assigned their mother's self-reported race/ethnicity, and not a combination of both parents' race/ethnicity. Several cautions should be kept in mind when using data reported by race/ethnicity. Race and ethnicity are social constructs, not biological facts. There is often more genetic variation between members of the same race than between members of different races. In addition, the meanings of these designations are highly subject to historical, cultural, and political forces. Not only do these designations change over time, but there is also a very subjective element that influences who is considered a member of one group or another. The concept of race can be notably broad: the term "Black," for example, includes people describing themselves as African American, African diaspora, or Caribbean,

groups with distinct histories and differing health risks. Nevertheless, racial designations are useful in that they are nearly universally used by people in the US to describe themselves, and they permit us to identify and address health inequities that exist across racial and ethnic groups.

In order to identify these inequities, racial/ethnic group comparisons involved using White residents as the reference group and assessing the difference between each non-White resident group rate (e.g., rate for Black residents) and the White resident (reference group) rate. For sex-based comparisons, males were the reference group. Latinx people can be of any race. In this report, data for persons of Hispanic and/or Latin descent are described as Latinx and presented alongside non-Hispanic racial groups. Boston specific data by race and ethnicity is presented for non-Hispanic Asian residents, non-Hispanic Black residents, non-Hispanic White residents, and Latinx residents of any race. Few sources have data in large enough counts to allow presentation of data on smaller groups i.e., the many ethnicities included under the category “Asian.” Additionally, small survey sample size and case numbers limit our ability to identify and describe health disparities for Indigenous people.

Neighborhood comparisons involved assessing the difference between a given neighborhood’s rate and the rate for the rest of Boston (those residents not living in the specified neighborhood). These comparisons are considered more accurate than comparisons to Boston overall.

For additional information regarding the analytical methods used within this report, please contact the Boston Public Health Commission Population Health and Research (PHAR) Office at populationhealth@bphc.org.

GLOSSARY OF STATISTICAL TERMS

Rates: A rate is a measure of a type of event, disease, or condition occurring among a population per unit(s) of time, for instance, the number of deaths due to diabetes per 100,000 population for a given year or across multiple years. In this report, death rates are based on the primary cause only. The population denominators used for calculating rates are derived through interpolation or extrapolation using data from the 2020 and 2010 US Census. Linear interpolation/extrapolation involves the calculation of an average annual percent change for use in estimating population denominators. Linear interpolation is preferred to using a single year of US Census data when calculating rates for intercensal years.

Statistical significance: An attribute of data based on statistical testing. A statistical test examines differences between rates or percentages to help determine if that observed difference reflects a true difference in the actual population experience, as opposed to one observed simply due to chance. Statistical significance means that an observed difference is most likely true; it does not mean that the difference is necessarily clinically meaningful or important.

DATA SOURCES

Source: Boston Resident Live Births, Registry of Vital Records and Statistics, Office of Data Management and Outcomes Assessment, Massachusetts Department of Public Health
These data present Massachusetts birth certificate information. The recording of resident live births is considered nearly complete for Massachusetts resident births, including those that take place at home or out-of-state but to Massachusetts residents. Birth data in this report pertain only to Boston residents.

For analytical purposes, infants are assigned their mother's self-reported race/ethnicity, and not a combination of both parents' race/ethnicity.

Boston Resident Deaths, Registry of Vital Records and Statistics, Office of Data Management and Outcomes Assessment, Massachusetts Department of Public Health: Death data used by the Boston Public Health Commission pertains only to Boston residents. This report used death data from 2012 to 2021. Death records are completed with the assistance of an informant, typically a family member or funeral director, which may result in errors (for example, in race/ethnicity reporting) that would not occur in self-reported data.

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