

# Boston Urban Indian Health Program

Community Health Profile & Individual Site Report



**Urban Indian Health Institute**  
A Division of the Seattle Indian Health Board

## **Acknowledgments**

Funding for this report was primarily provided by the Indian Health Service Division of Epidemiology and Disease Prevention. The report contents are solely the responsibility of the authors and do not necessarily represent the official views of the Indian Health Service.

Urban Indian Health Institute would like to thank the staff at the urban Indian health and social service organizations nationwide for the excellent work they do daily on behalf of their communities.

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## **Terminology**

The authors use the terms “Native”, “Indian”, “Indigenous” and “American Indian and Alaska Native” interchangeably throughout this report. The demographic terminology included in source material is referenced when appropriate.

## **Recommended Citation**

Urban Indian Health Institute, Seattle Indian Health Board (2021). *Boston Urban Indian Health Program: Community Health Profile & Individual Site Report*. Seattle, WA: Urban Indian Health Institute.

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# EXECUTIVE SUMMARY

Urban Indian Health Institute (UIHI) analyzed data from the American Community Survey (ACS), the National Vital Statistics System (NVSS), National Notifiable Disease Surveillance System (NNDSS), and Behavioral Risk Factor Surveillance System (BRFSS) to describe health outcomes among urban American Indians and Alaska Natives across more than 30 health indicators.

This Community Health Profile aggregates data on the sociodemographics, maternal and child health, infectious disease, and mortality of American Indians and Alaska Natives (AI/ANs) in the Boston UIH service area. The data in this report are five-year estimates from 2013 to 2017.

Key findings show that urban American Indians and Alaska Natives (AI/AN) frequently experience higher proportions of poverty and inequities in infant and maternal health, access to health insurance, and household income when compared to their non-Hispanic White (NHW) counterparts. We acknowledge the role colonization has had on Indigenous communities and the health indicators listed in this report.

As this profile may show, there is still work to be done from local, state, and federal entities to collect quality, accurate data. Urban Indian Health Programs should work closely with their local and state health jurisdictions to access the most current data and, where possible, urge better tracking of demographics to inform care.

# KEY FINDINGS

The proportion of AI/AN children aged 17 and under who lived in households with an income below the federal poverty level was 3.0 times that of NHW children (17.7% vs 5.9%).

The proportion of SNAP participation among AI/AN households was 4.9 times that of NHW households (32.5% vs 6.7%).

The proportion of uninsured AI/AN children under the age of 19 was only 18% that of their NHW counterparts (0.2% vs 1.1%).

The proportion of births to AI/AN teenage women was 5.2 times that of NHW teenage women (5.7% vs 1.1%).

Pregnant AI/AN women were no more likely than pregnant NHW women to be diagnosed with gestational diabetes (4.8% vs 4.9%, no statistical significance).

Pregnant AI/AN women were no more likely than pregnant NHW women to give birth preterm (9.8% vs 8.9%, no statistical significance).

AI/AN newborns were no more likely than NHW newborns to be admitted to the NICU (9.2% vs 9.5%, no statistical significance).

The age-adjusted all-cause mortality rate for the AI/AN population was approximately 68.7% lower than the mortality rate of the NHW population (209.1 deaths per 100,000 vs 668.7 deaths per 100,000).

The rate of mortality due to cancer for AI/AN people was 25.9% that of NHW people (40 deaths per 100,000 vs 154.7 deaths per 100,000).

# INTRODUCTION

Across the United States, an examination of the health outcomes of urban Native people shows a disproportionately high incidence of disease, co-morbidity, and mortality, particularly among mothers. This is significant because, of the 5.2 million Americans who identify as American Indian and/or Alaska Native, 71% live in urban areas.<sup>1</sup> To meet their health needs, numerous health and social service programs provide culturally attuned and holistic care. Many offer services that are grounded in Indigenous knowledge and bring traditional and Western medicine together.

As Urban Indian Health Programs and other Urban Indian Organizations strive to provide the highest-quality care to urban Native people, relevant data are needed. Since 2000, Urban Indian Health Institute (UIHI) has created an aggregate Community Health Profile (CHP), along with individual CHPs for each of the UIH sites serving the urban Indigenous population in their area.

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## Who are urban Indians?

Urban Indians are tribal members who are currently living outside of federally defined tribal lands in U.S. cities.<sup>1</sup> For many Native communities, systemic issues such as racism, poverty, and poor education have given rise to health disparities.<sup>2</sup> For urban Indians, government policies that forced relocation in the 1950s, and termination policies that forced assimilation into non-Native culture, have had long-term negative health effects.<sup>2</sup> Indigenous people come to cities for educational, employment, or housing opportunities and health care needs, resulting in an Indigenous urban population that is diverse and inter-tribal.

## How to use this report

Improving community health through effective planning and decision making requires reliable information.<sup>2</sup> This CHP provides an overview of the health status of American Indian and Alaska Native populations who reside in the UIH service areas (Appendix A: Service Areas). While limited in scope and restricted to available data, this report provides valuable information for service providers serving an urban Indian population with unique needs and health priorities. The report is intended for use as a supplement to other local data available and can be used for program planning, applying for funding, identifying gaps in data, and conducting research.



# METHODS AND DATA

**THIS REPORT INCLUDES INFORMATION FROM RESIDENTS OF THE BOSTON UIH SERVICE AREA, INCLUDING ESSEX COUNTY, MIDDLESEX COUNTY, NORFOLK COUNTY, PLYMOUTH COUNTY, AND SUFFOLK COUNTY, USING THE FOLLOWING DATA SOURCES:**

- American Community Survey, 2013–2017
- 2010 U.S. Census, 2013–2017
- National Vital Statistics System; Death Certificates, 2013–2017
- National Vital Statistics System; Birth Certificates, 2013–2017
- National Notifiable Disease Surveillance System, 2013–2017
- Behavioral Risk Factor Surveillance System, 2013–2017

There are limitations to this data, particularly due to variations in how race is defined and collected.

## Data Sources

### 2010 U.S. Census

The U.S. Census takes place every 10 years and provides official population counts for individuals living in the United States. It also presents information on age, race, Hispanic origin, and sex. Starting in 2000, the U.S. Census allowed individuals to self-report belonging to more than one racial group. Prior to the 2000 U.S. Census individuals could only select one racial group. When determining a population count, this report considers people to be AI/AN if they report AI/AN as their only race or, if available, they report being AI/AN in combination with other races.

For more information about the U.S. Census, visit: [www.census.gov](http://www.census.gov)

## American Community Survey

The American Community Survey (ACS) is a nationwide survey that collects demographic, housing, social, and economic data every year. To provide reliable estimates for small counties, neighborhoods, and population groups, the ACS provides one-, three-, and five-year aggregate estimates.

Race is self-reported in ACS with similar race categories as the U.S. Census. However, some ACS data are not easily accessible for multiple racial groups. Therefore, ACS data are reported for AI/AN alone in this report. ACS estimates in this profile are not adjusted for age. Observed differences in estimates may be due to a true difference in proportions or due to differences in age distribution in the population.

For more information about the ACS, visit: [www.census.gov/acs](http://www.census.gov/acs)

## National Vital Statistics System

Mortality data from the National Vital Statistics System (NVSS) is generated from death certificates. All mortality data are age-adjusted to the U.S. population for the year 2000. Age-adjusted death rates are useful when comparing different populations because they remove the potential bias that can occur when comparing populations with different age distributions. For example, AI/ANs historically are a younger population than other racial groups.

Birth certificate data from NVSS data files include all documented births occurring within the U.S. as filed in each state. These data include demographic information about parents, the mother's risk factors, information on the infant, and information on the birth.

Since not all states allow individuals to identify as more than one race, National Center for Health Statistics (NCHS) releases bridged-race population estimates for calculation of rates. The bridged-race population estimates are the result of bridging the 31 race categories in the Census 2000 and Census 2010 to four race categories due to the shifting use of 1977 Office of Management and Budget (OMB) standards to 1997 OMB standards. As a result, estimates in this report may not match local and county estimates because of differing projection methods.

For more information about Vital Statistics, visit: <http://www.cdc.gov/nchs/nvss.htm>

For more information about bridged-race, visit: [https://www.cdc.gov/nchs/nvss/bridged\\_race.htm](https://www.cdc.gov/nchs/nvss/bridged_race.htm)

### National Notifiable Disease Surveillance System

Sexually transmitted infections (STIs) are a component of the National Notifiable Disease Surveillance System (NNDSS). Incident cases are submitted to the Centers for Disease Control and Prevention (CDC) from state health departments and other local reporting jurisdictions. The majority of cases are reported in non-STI clinic settings such as private physician offices. It is mandatory that reportable disease cases be reported to state health departments when identified by a health provider, hospital, or laboratory. However, it is voluntary that notifiable disease cases be reported to the CDC by the state for national surveillance. Estimates of rates are based on the states for the UIH service areas.

For more information about NNDSS, visit: <https://www.cdc.gov/nndss/>

### Behavioral Risk Factor Surveillance System

Behavioral Risk Factor Surveillance System (BRFSS) is a nationwide health-related telephone survey that collects state data about U.S. residents. Random Digit Dialing (RDD) is used to conduct the surveys on landlines and cellphones. Each state uses a standardized core questionnaire, optional modules, and state-added questions. A vast amount of data on health-related risk behaviors and events, chronic health conditions, and use of preventive services are collected by this survey.

For more information about BRFSS, visit: <https://www.cdc.gov/brfss/index.html>

### Data Limitations

Frequently, data are only available for AI/AN alone and not inclusive of AI/AN who also identify with another race or ethnicity. Therefore, the outcomes may be an underestimation of the true value of an outcome or risk factor for any indicator analyzed.

Racial misclassification impacts the accuracy of rates of disease, risk factors, or outcomes, which leads to underestimations. Racial misclassification occurs when the race of an individual is captured inaccurately, whether it be from the subjective use of personal observation by the data collector or using a surname to determine race/ethnicity. AI/AN people are more likely to experience incorrect classification on death certificates. Therefore, true morbidity and mortality rates among AI/AN people are assumed to be higher than presented in this report.<sup>3,4</sup>

### Analysis

A list of indicators for the community health profile was selected after investigating available data sources. For each indicator, prevalence or incidence is calculated for the AI/AN population and compared to the NHW population. NHWs are included as the comparison group to assess disparities in health indicators in recognition of the effects of structural racism on health. The AI/AN population was defined as AI/AN only and AI/AN in combination with other races, unless otherwise indicated. The NHW population was defined as White only and excluded the Hispanic population, unless otherwise indicated. Results are calculated using aggregated data over a five-year period.

In some instances, confidence intervals—an interval of numbers used to assess the accuracy of a point estimate and measure the variability in data—are calculated and used to show differences in outcomes for specific indicators. The point estimate may be a rate such as a death rate or a frequency such as a percent of individuals living in poverty.

Confidence intervals also account for the difference between a sample from a population and the population itself. For analyses included in this report, confidence intervals are calculated at a p-value of  $<0.05$ , a 95% confidence level. This means that 95 times out of 100 the confidence interval captures the true value for the population. Where confidence intervals of the study group (AI/AN) do not overlap with the comparison group (NHW), this may be an indication of a true difference in outcomes.

Standard data suppression was used to protect the privacy of individuals within all groups, including suppression of any estimates or rates based on counts of less than 10. As a result, certain indicators that are included in the aggregate CHP are not available for individual sites due to small numbers.



# SOCIODEMOGRAPHICS

The health of an individual or a population is largely determined by where they live, work, play, and learn. Race and economic status also play key roles.<sup>5,6</sup> Decades of research show a relationship between greater social disadvantage and poorer health. Race, lack of access to education, unemployment, poverty, and housing all create inequities between urban AI/AN and NHW populations.<sup>5</sup> This section presents data on measures of demographics and social determinants of health to illustrate the disparities between AI/AN and NHW populations.

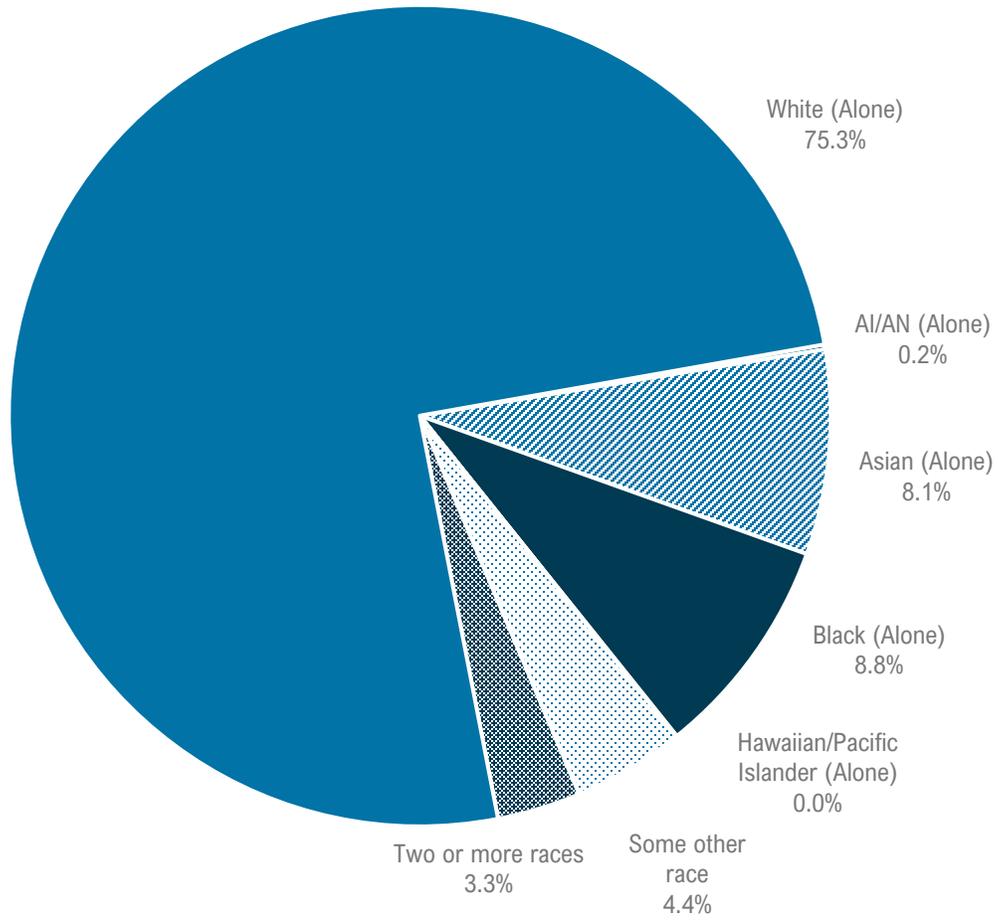
## Race

Race, ethnicity, and socioeconomic status directly impact the distribution of disease.<sup>7</sup> Lacking access to education, employment, and other opportunities is often distributed along racial lines, thus we see stark health disparities between racial groups. Therefore, it is important to not only understand the rates of disease within a given area but also the racial distribution.

An estimated 26,749 (0.6%) individuals identified as AI/AN alone or in combination with one or more races in the Boston service area, with 8,395 (0.2%) individuals identifying as AI/AN alone (Figure 1). Those who identified as White alone comprised the largest proportion (approximately three-fourths) of the total population (75.3%) in the Boston UIH service area.

How race is defined in data matters. All sociodemographic estimates in this report represent those that identify as AI/AN alone—this is due to a limitation in the data. AI/AN are among the fastest growing multiracial group in the U.S.<sup>1</sup>

Figure 1. Population by Race, Boston, 2013-2017

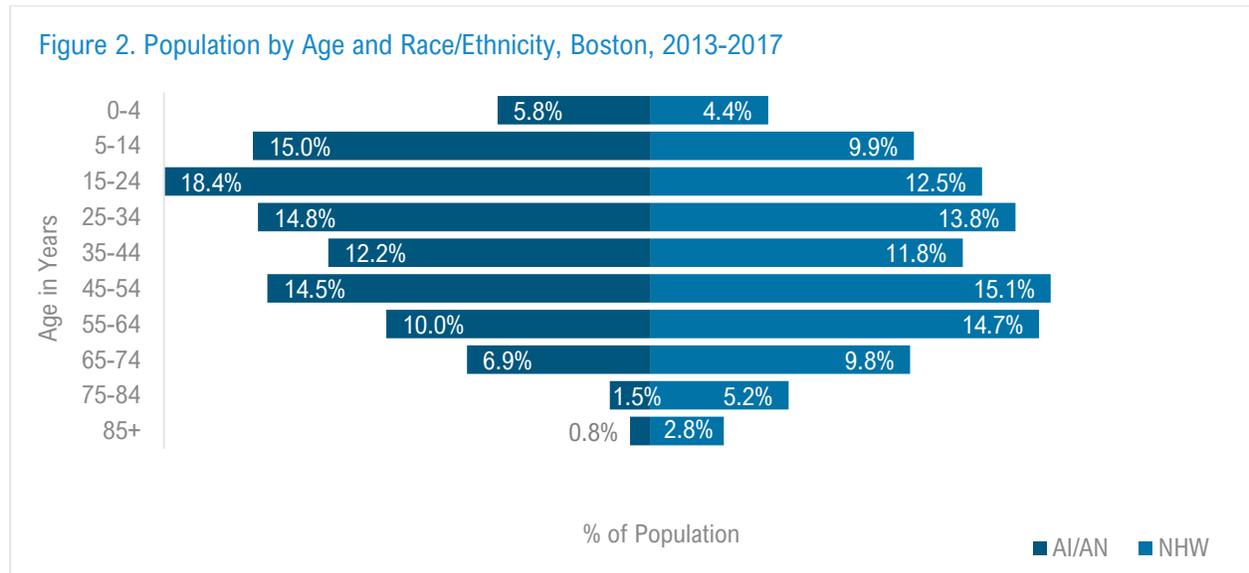


Source: American Community Survey, 2013-2017

## Age and Sex

Rates of disease and risk factors can often vary widely between age groups as well as between sexes. For example, life expectancy differs by both race and sex. Therefore, we stratify by both age and sex to examine these differences more closely.

Relative to the NHW population, the AI/AN population in the Boston UIH Service area was younger (Figure 2). Of the AI/AN population, 39.2% were under the age of 25 years, compared to 26.8% of the NHW population. In contrast, 9.19% of the AI/AN population were over the age of 65 years, compared to 17.8% of the NHW population.



Source: American Community Survey, 2013-2017

Among the AI/AN population in the Boston UIH Service Area, there were more males (50.5%) than females (49.5%), in contrast to the NHW population in the area (Figure 3).



Source: American Community Survey, 2013-2017

## Poverty

Poverty limits access to healthy foods, quality housing, economic opportunities, and adequate health care.<sup>8,9</sup> These foundational social and economic factors are inextricably connected to health outcomes. Also, the impacts of poverty on the health and well-being of a child can be detrimental and may have negative effects on early childhood and secondary academic achievement.<sup>10,11</sup>

In the Boston UIH service area, AI/AN children experienced more poverty than NHW children (Figure 4). Over a sixth of AI/AN children aged 17 and under (17.7%) lived in households with an income below the federal poverty level. This proportion is 3.0 times that of NHW children (5.9%). Less than a quarter of AI/AN families in the Boston UIH service area (23.3%) lived in households with an income below the federal poverty level, almost 6.13 times that of their NHW counterparts. In addition, 31.8% of AI/AN single mother households experienced poverty, 2.6 times that of the proportion of NHW single mother households (12.1%). Finally, about a fifth of AI/AN individuals lived in poverty (19.7%), compared to 6.6% of NHW individuals.

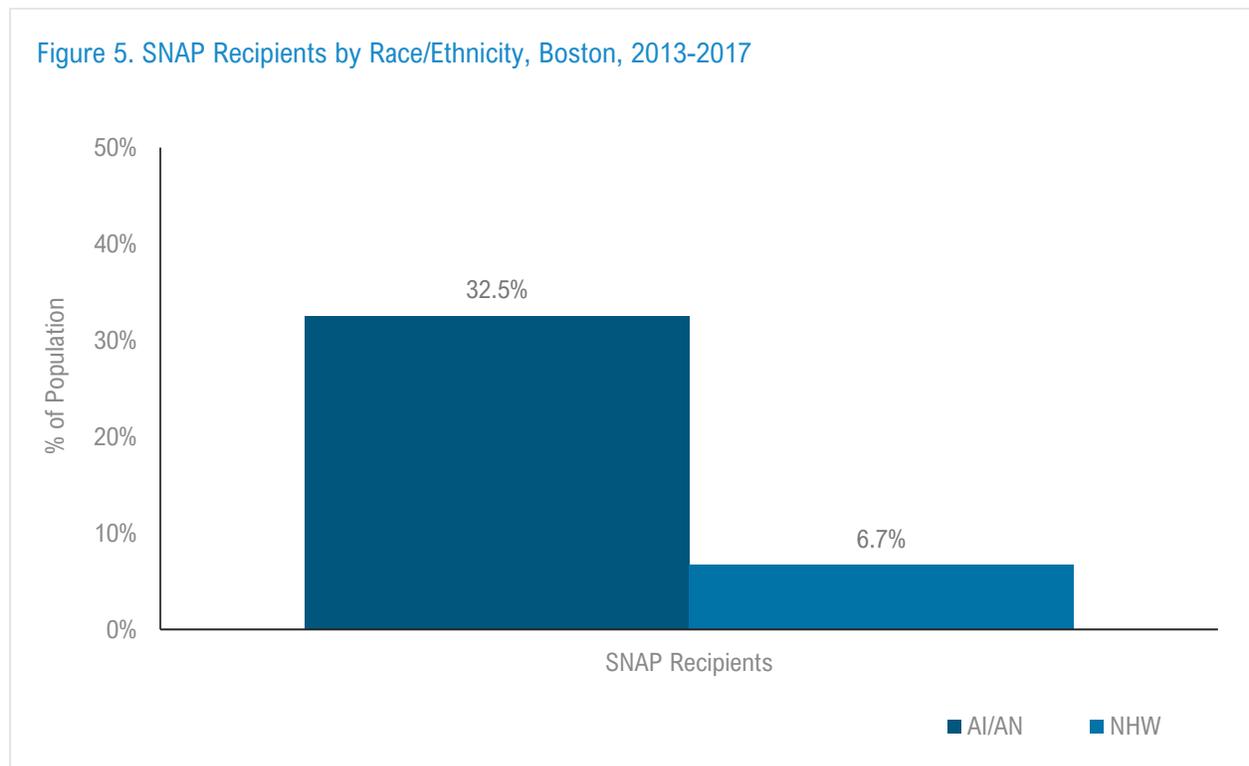


Source: American Community Survey, 2013-2017

## Supplemental Nutrition Assistance Program

Households experiencing poverty are more likely to be food insecure.<sup>12</sup> Food insecurity can have a negative effect on the overall health of an individual, which increases the susceptibility to negative health outcomes.<sup>13</sup> As the largest food assistance program in the United States, the Supplemental Nutrition Assistance Program (SNAP), formerly known as the Food Stamp program, is a crucial part of the social safety net.<sup>14</sup> SNAP reduces the prevalence of food insecurity and, in turn, can reduce the prevalence of negative health outcomes.<sup>13</sup> In most states, many households with an income below 130% of the federal poverty level are eligible to receive SNAP benefits.

In the Boston UIH service area, about a third of AI/AN households received SNAP benefits in the past year (32.5%; Figure 5). The proportion of SNAP participation among AI/AN households in these areas was 4.9 times that of NHW households (6.7%).

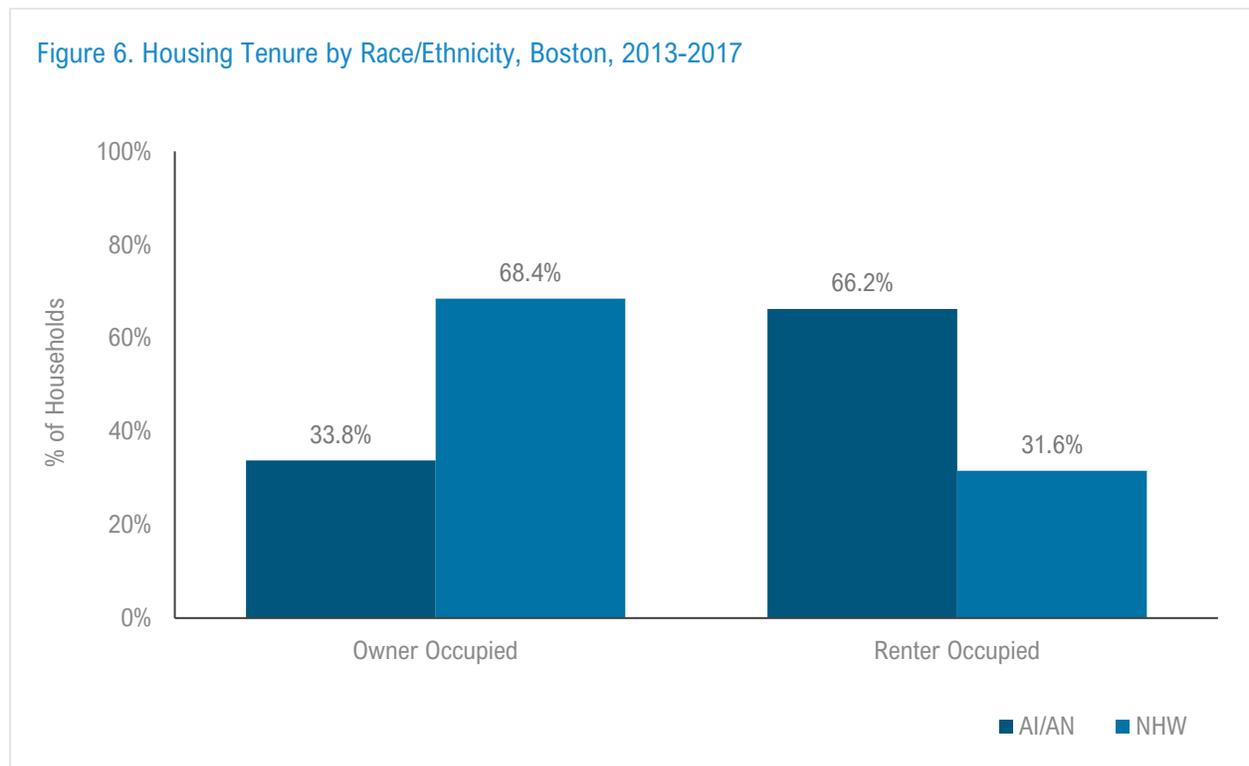


Source: American Community Survey, 2013-2017

## Housing

Several studies have found that home ownership is associated with many health benefits.<sup>15,16</sup> These benefits may be explained by the fact that homeowners likely experience higher socioeconomic status, fewer problems of overcrowding, and lower exposure to neighborhood violence. In contrast, renters are more likely to experience poorer self-reported health, higher proportions of coronary heart disease, and more risk factors such as smoking.<sup>17</sup>

In the Boston UIH service area, two-thirds of the AI/AN population (66.2%) owned their own homes compared to approximately a third of the NHW population (31.6%; Figure 6). The proportion of the AI/AN population who owned their own homes was 2.1 times that of the NHW population. In contrast, in the Boston UIH service area, home ownership was 50.6% lower for AI/AN households than NHW households (33.8% vs 68.4%, respectively).

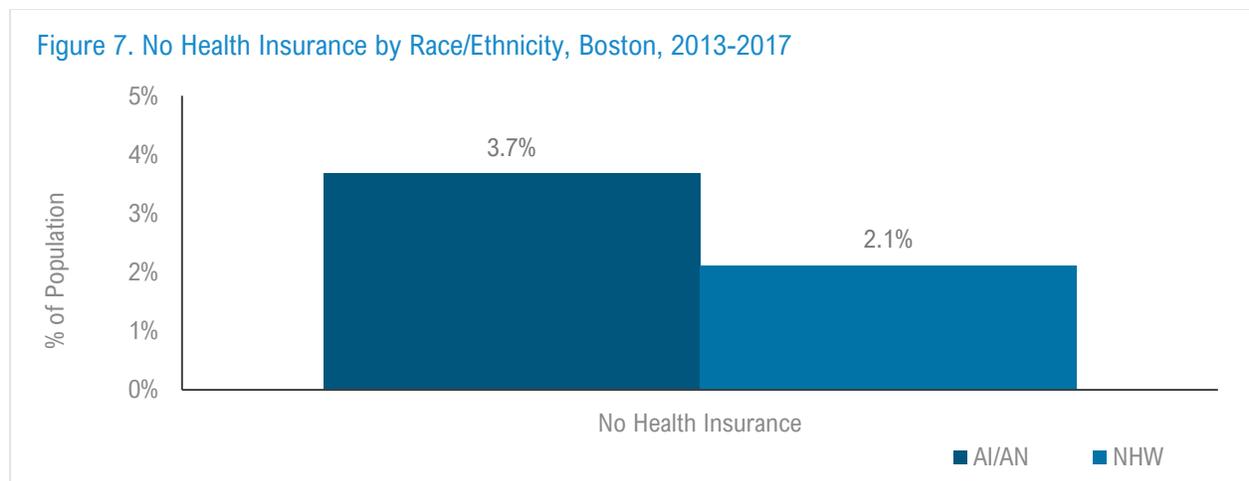


Source: American Community Survey, 2013-2017

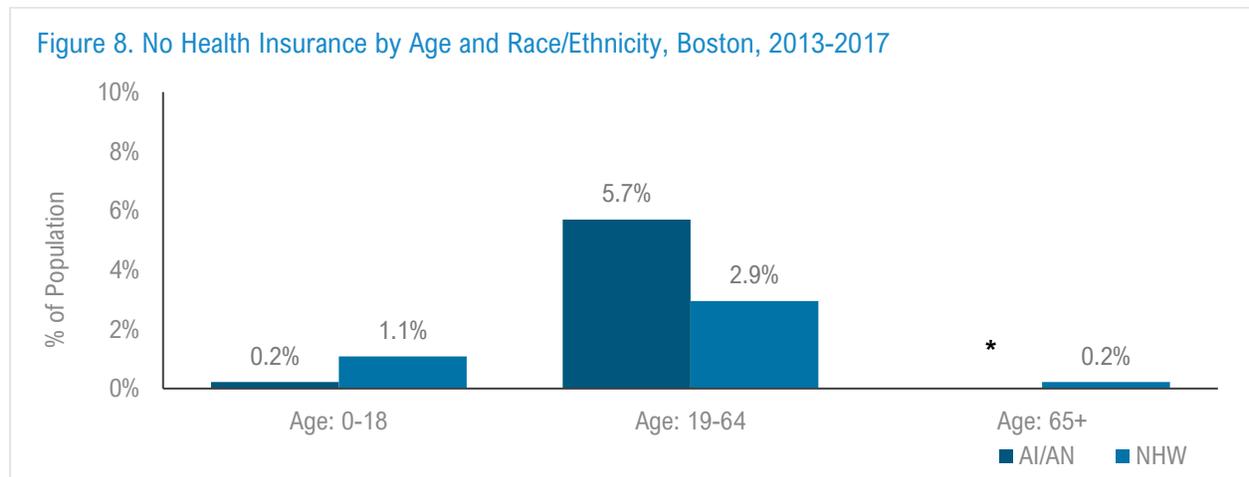
## Health Insurance Coverage

Those without health insurance coverage have higher mortality rates than those with coverage.<sup>18</sup> Individuals without health insurance are also less likely to receive care and often take longer to recover after an unintentional injury or the onset of a chronic disease than those with health insurance.<sup>19</sup>

In the Boston UIH service area, 3.7% of the AI/AN population reported having no health insurance, compared to 2.1% of the NHW population (Figure 7). 5.9% of the AI/AN population under 65 years of age reported having no health insurance, a proportion 1.5 times that of the NHW population (4%; Figure 8). However, the proportion of uninsured AI/AN children under the age of 19 (0.2%) in the Boston UIH service area was only 18% that of their NHW counterparts (1.1%).



Source: American Community Survey, 2013-2017



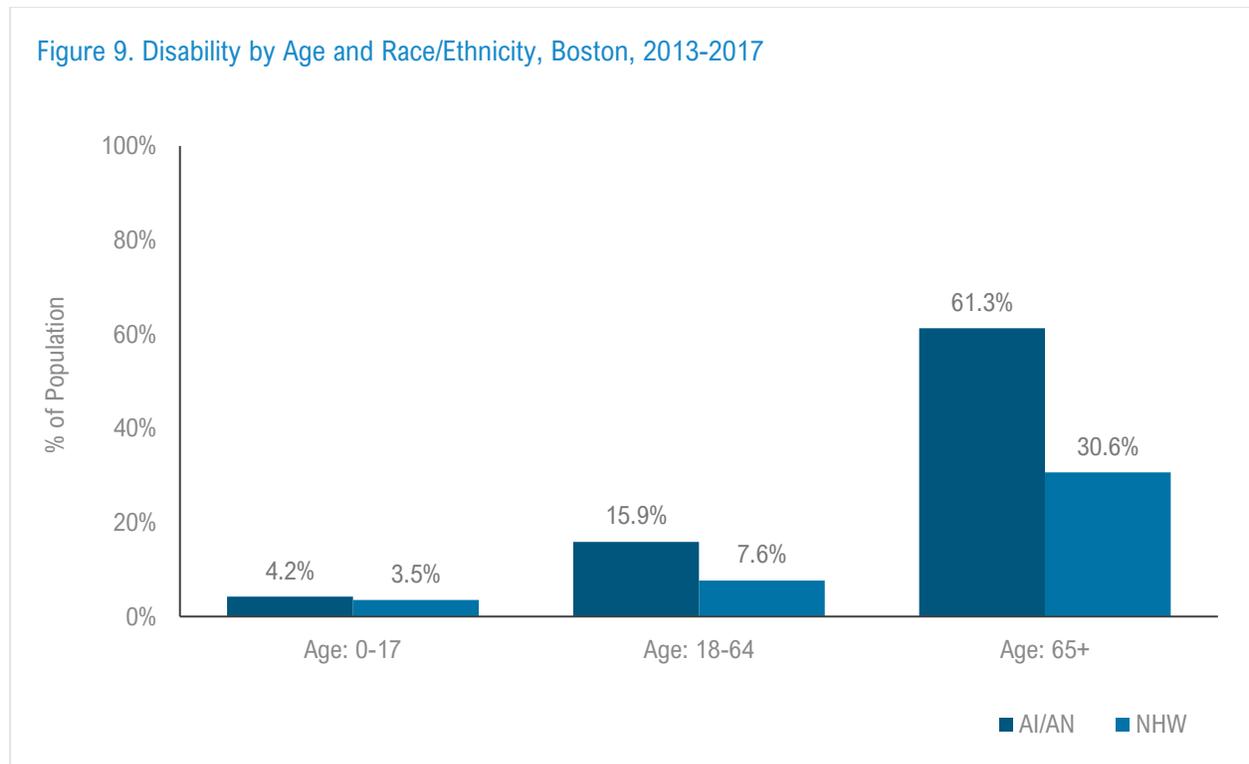
Source: American Community Survey, 2013-2017

\* Suppressed data < 10.

## Disability Status

A disabling condition can be present at birth, occur early in life, can be acquired through injury or a chronic condition, or can develop later in life.<sup>20</sup> In general, across a range of health indicators and social determinants of health, people with disabilities tend to fare worse than their nondisabled counterparts.<sup>20</sup> It is important to include prevalence of disability as a foundation to monitor health status and existing disparities to inform program planning and to potentially obtain funding for programs for people with disabilities. However, it is important to note that the understanding of disability varies across Indigenous cultures—current ways of understanding disability are largely a result of colonization.<sup>21</sup>

In the Boston UIH service area, for those under 18, 4.2% of AI/AN people reported having a disability, compared to 3.5% of NHW people (Figure 9). For those aged 18-64, the proportion of AI/AN individuals who reported having a disability was 2.1 times that of NHW individuals in the same age range who reported having a disability (15.9% vs 7.6%, respectively). Additionally, 61.3% of AI/AN individuals over the age of 65 reported having a disability compared to 30.6% of NHW individuals over the age of 65.

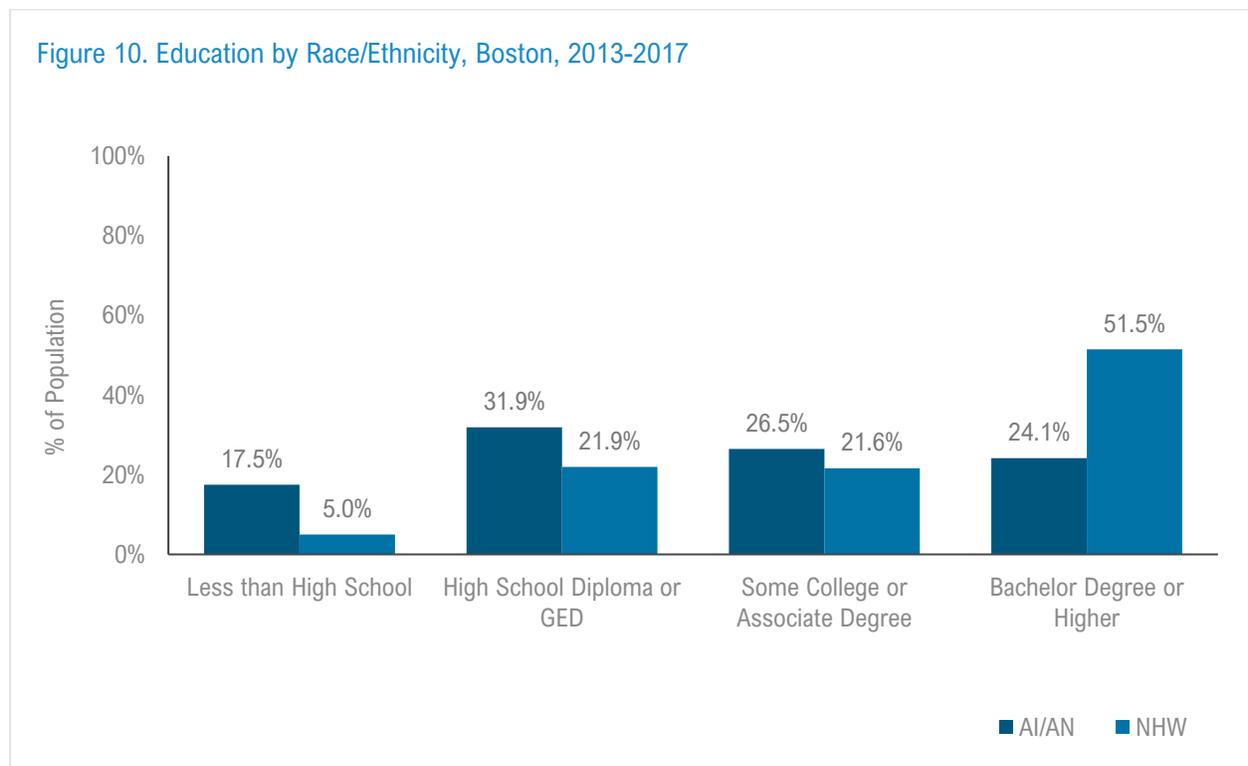


Source: American Community Survey, 2013-2017

## Education

The relationship between education and health is well documented.<sup>22,23</sup> Those with more education are generally more likely to be employed and have access to health resources through insurance. They are also more likely to have a higher income, allowing them to afford resources when needed. Thus, disparities in life expectancy by level of education are found among all demographic groups and are increasing over time.<sup>23</sup>

In the Boston UIH service area, a higher percentage of AI/AN people aged 25 and older had neither completed high school nor passed the General Education Development (GED) exam (17.5%) compared to the NHW population (5.0%; Figure 10). A lower percentage of the AI/AN population (24.1%) reported an undergraduate or graduate degree as their highest level of education compared to the NHW population (51.5%). However, a higher percentage of the AI/AN population reported attending some college, receiving an Associate’s degree, or receiving a Bachelor degree or higher than reported receiving a high school diploma/equivalent or no diploma (50.6% vs 49.4%, respectively).

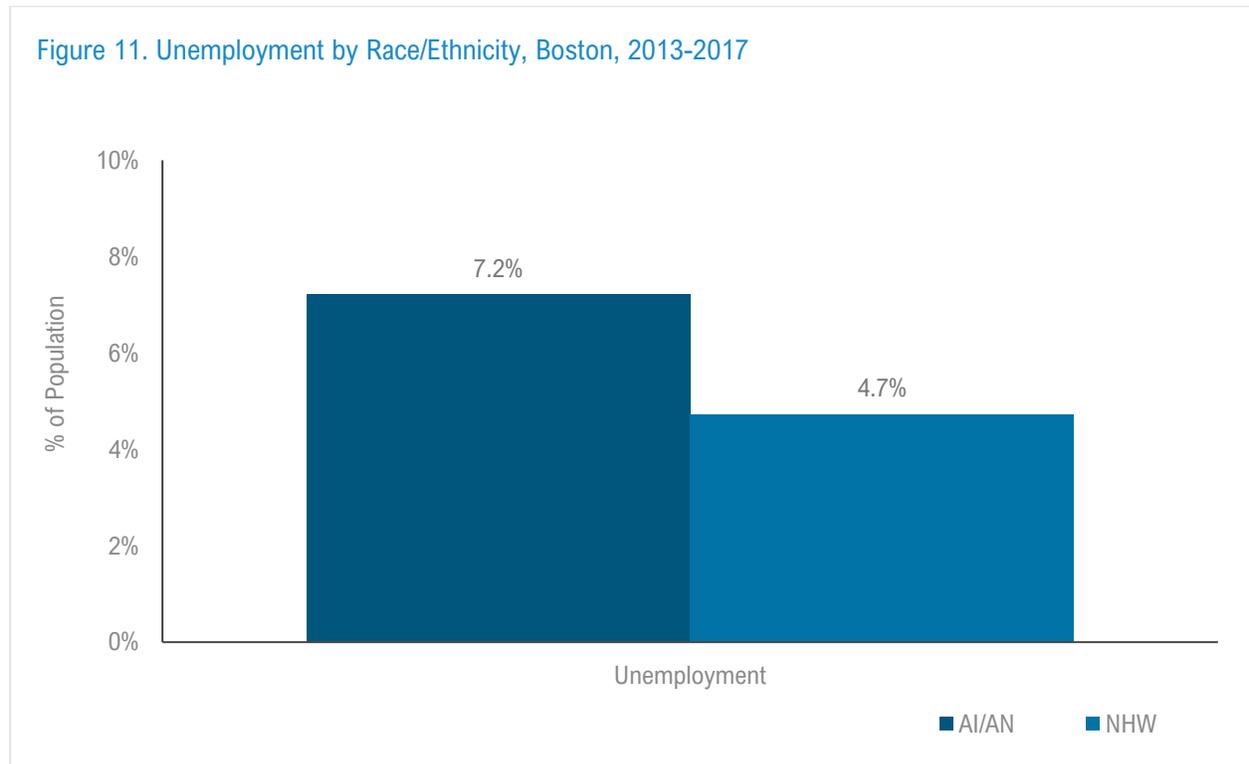


Source: American Community Survey, 2013-2017

## Unemployment

Extensive evidence has shown that unemployment has a negative effect on health.<sup>24</sup> Individuals experiencing unemployment may experience financial insecurity and are more likely to lack health insurance coverage.<sup>25</sup> Beyond that, unemployment can be identified as a major stressor, causing lasting damage to the physical and emotional health of an individual.<sup>26</sup>

In the Boston UIH service area, the percent of unemployed AI/AN individuals over 16 years of age was 1.5 times that of NHW individuals (7.2% vs 4.7%; Figure 11).



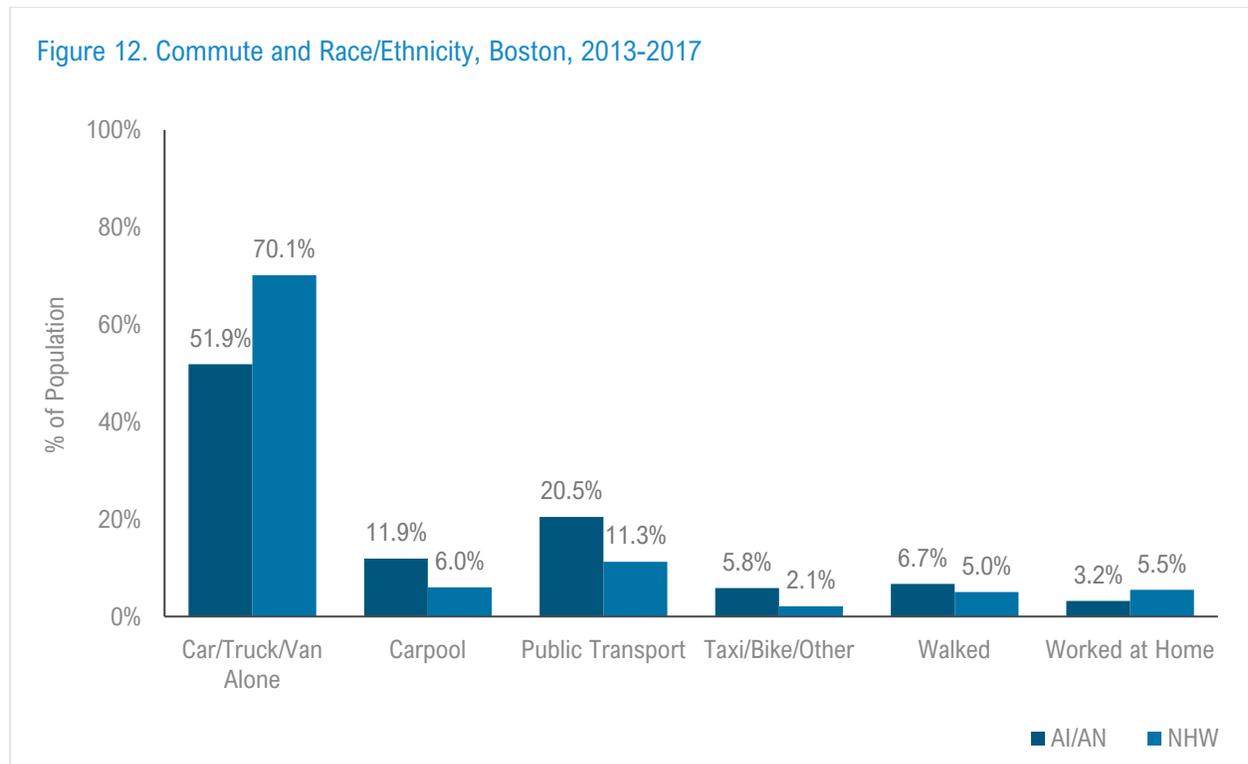
Source: American Community Survey, 2013-2017

## Means of Transportation to Work

How individuals travel to work impacts their health.<sup>27</sup> Researchers are still studying the effects long commutes may have on health.<sup>28</sup> Time spent commuting is most often reallocated from physical activity, food preparation, time eating with family, and sleeping.<sup>29</sup> Over time, these changed behavioral patterns can contribute to poor health outcomes. This indicator offers a starting step to understanding how the health of urban AI/AN people may be impacted by their commute.

For the Boston UIH service area, AI/AN and NHW workers had relatively different means of transportation to work (Figure 12). The proportion of AI/AN workers who travelled to work in a car, truck, or van was three-quarters that of NHW workers (51.9% vs 70.1%, respectively). A difference was also seen among those who work at home, which was 2.3% lower for AI/AN workers than NHW workers (3.2% vs 5.5%, respectively). Additionally, the proportion of AI/AN people who carpooled was twice that of NHW people who carpooled (11.9% vs 6.0%, respectively). AI/AN people had a rate 1.8 times the rate of NHW people for taking public transport, and a rate 1.3 times the rate of NHW people for walking to work. Similarly, AI/AN people had a rate 2.8 times that of NHW people for taking a taxi, bike, or other means of transportation.

Figure 12. Commute and Race/Ethnicity, Boston, 2013-2017



Source: American Community Survey, 2013-2017

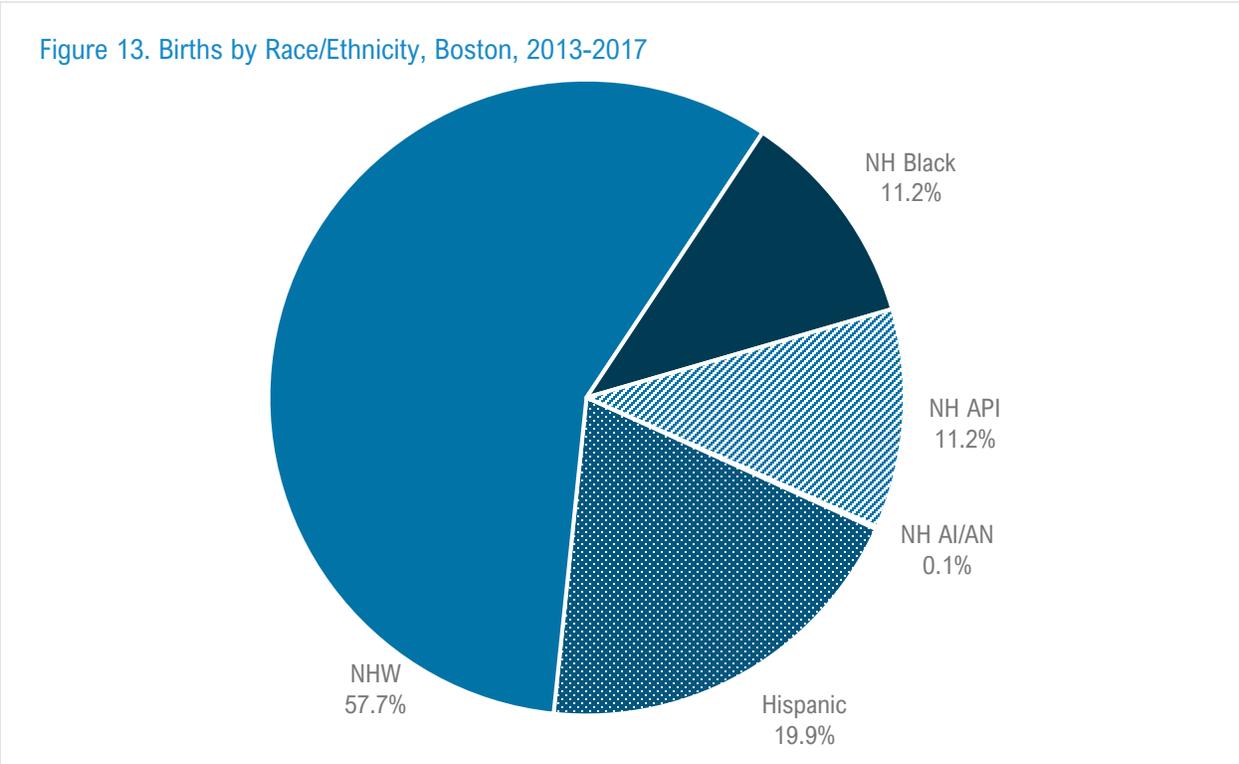


# MATERNAL AND CHILD HEALTH

Understanding the state of maternal and child health (MCH) for urban Indians is key to creating the foundation for healthy children, mothers, and future generations. Tracking maternal smoking, gestational diabetes, prenatal care, and preterm births can help urban Indian health organizations make the best decisions regarding programs for pregnant mothers and infants. For the purposes of this report, language around birth and maternal health data includes traditionally female terminology, but it is understood that not every person who gives birth identifies as such.

## Births by Race/Ethnicity

From 2013 to 2017 there were a total of 237,784 births across the Boston UIH service area. Among those births, about 0.1% (316 births) were identified as non-Hispanic American Indian or Alaska Native (AI/AN) alone (Figure 13). The largest proportions of births among the racial/ethnic groups were from non-Hispanic White (NHW) women (57.7%) and Hispanic women (19.9%). Non-Hispanic Black women accounted for 11.2% of all births, while Non-Hispanic Asians and Pacific Islanders were 11.2% of all births.

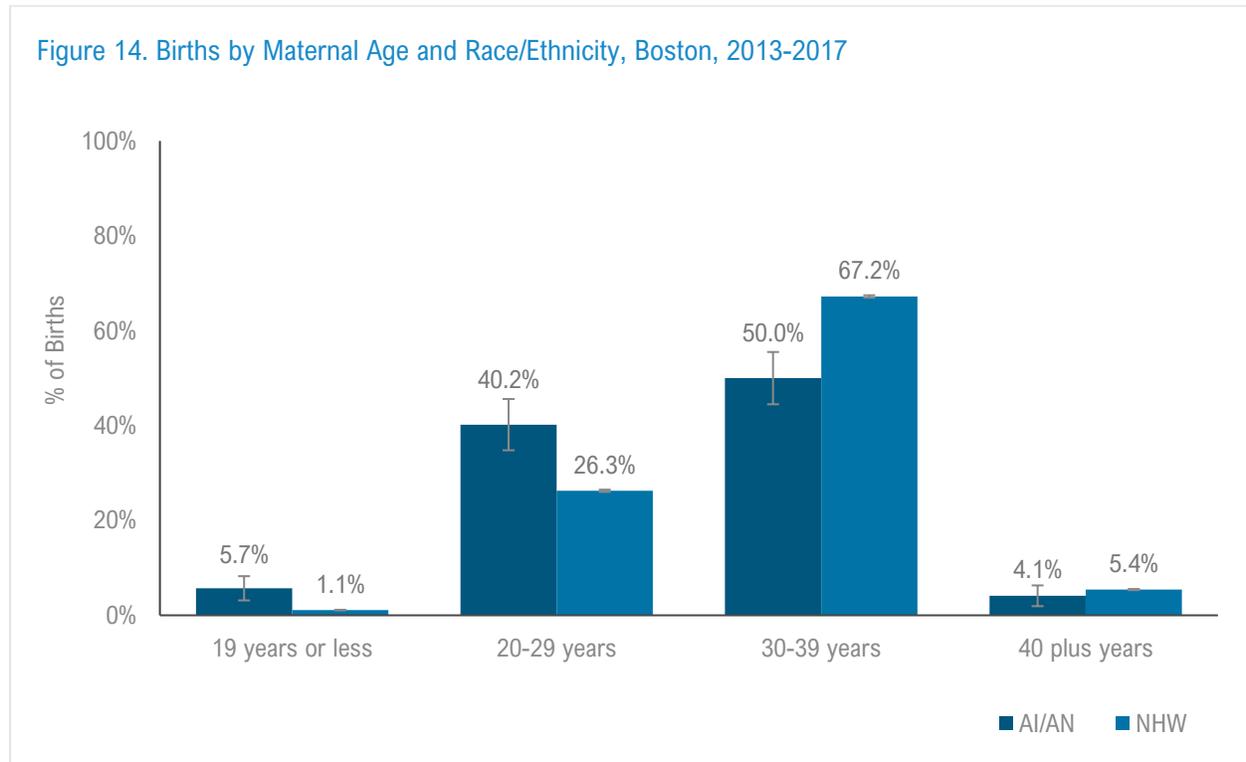


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Births by Maternal Age Group

Birth by maternal age group is a valuable indicator to estimate access to family planning resources and services.<sup>30</sup> For example, pregnant adolescents have an increased risk of preterm labor and birth, preeclampsia, and demonstrated greater odds of other health complications for both the mother and infant.<sup>30</sup> In addition, pregnant women over the age of 35 also demonstrated increased odds of preterm delivery, hypertension, and other complications.<sup>30</sup>

In general, AI/AN women tended to give birth at statistically significantly younger ages than their NHW counterparts (Figure 14). Across the Boston UIH service area, 5.7% of all births among AI/AN women were to teenage women (19 years or younger) compared to 1.1% of NHW births. The proportion of births to AI/AN teenage women was 5.2 times that of NHW teenage women. In addition, 40.2% of all births among AI/AN women were to women in their 20s, which is higher than the 26.3% among NHWs. Conversely, NHW women had more children in their 30s compared to AI/AN women (67.2% vs. 50.0%).

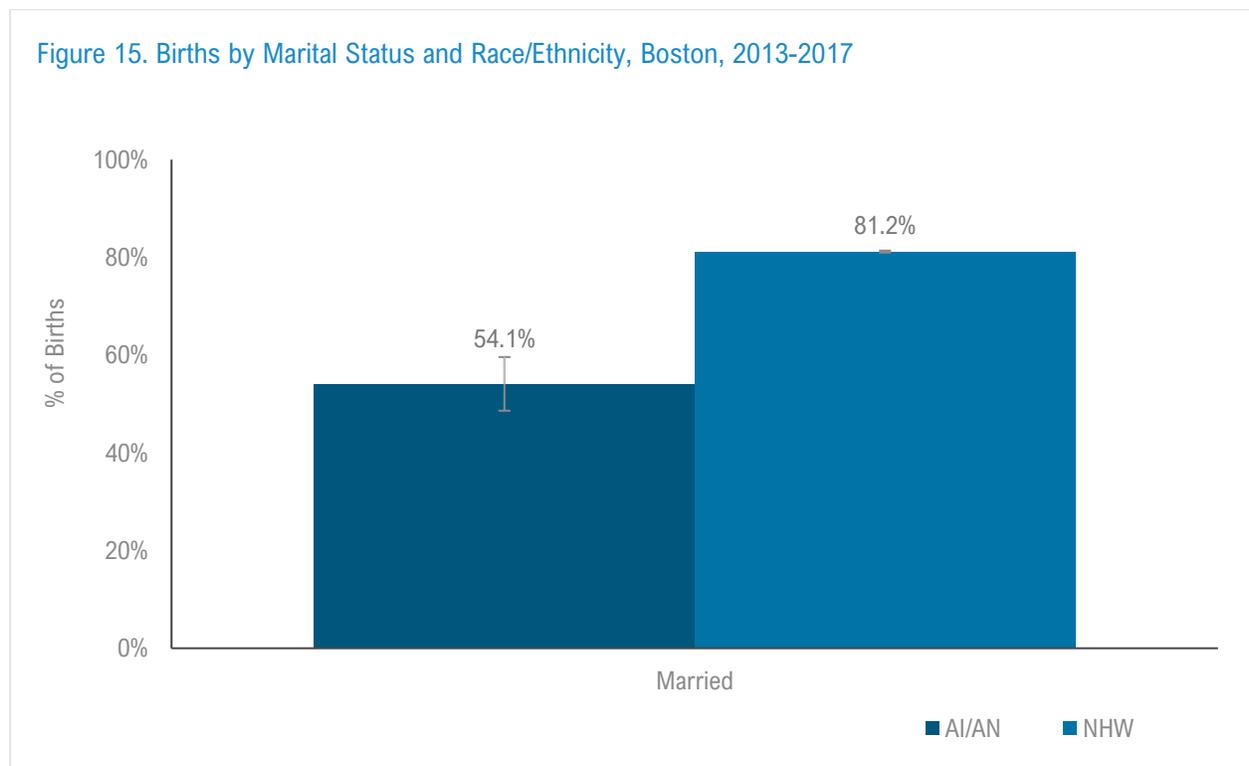


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Births by Marital Status

Studies have shown positive associations between marriage and health outcomes.<sup>31</sup> Married couples tend to have more than one income source providing for their family, allowing them to afford nutritious food and access to other health resources.<sup>31</sup> Marital status during first birth has been found to be associated with health outcomes later on in their lives for white and black women.<sup>32,33</sup>

Across the Boston UIH service area, 54.1% of all births to AI/AN women were to mothers who were married (Figure 15). This was statistically significantly different compared to NHW women, among which 81.2% of births were to mothers who were married. The proportion of births to unmarried AI/AN women was 2.4 times that of their NHW counterparts.

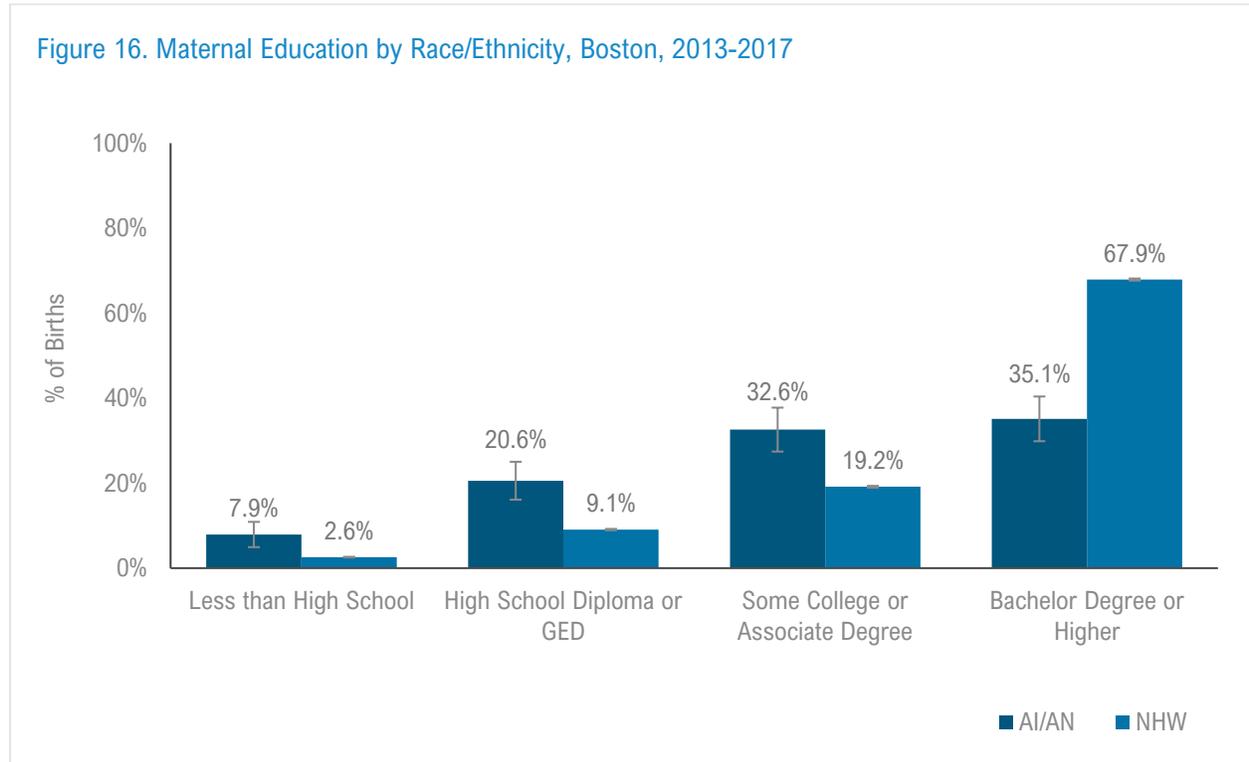


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Maternal Education

Numerous studies have looked at the causal link between maternal education and maternal and child health outcomes.<sup>34</sup> A mother’s primary school completion was found to be associated with positive infant health outcomes, indicated by birth weight.<sup>35</sup>

Approximately 7.9% of AI/AN births in the Boston UIH service area were to AI/AN women who did not complete high school and 20.6% were to AI/AN women whose highest level of education was a high school diploma or equivalent degree (Figure 16). These were both higher proportions than those of NHW women who did not complete high school (2.6%) or received a high school diploma or equivalent degree (9.1%). Approximately a third of AI/AN births were to mothers who had attended some college or received an Associate degree (32.6%). The percentage of births to AI/AN women with some college or a higher degree was statistically significantly lower than among NHW women (53.1% vs 67.9%, respectively).

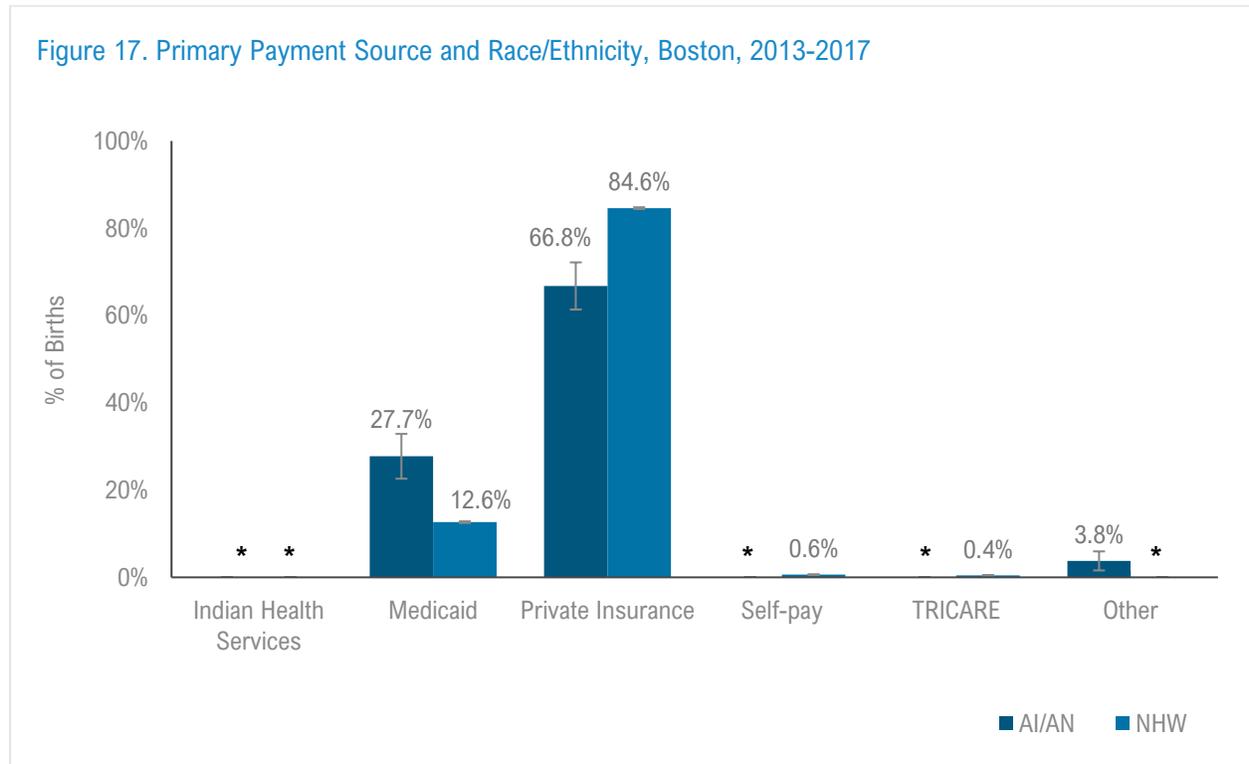


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Insurance Status

Maternity health coverage became mandatory in 2014 under the Affordable Care Act. A study prior to 2014 found differences in health insurance coverage could affect the type of care received during childbirth.<sup>36</sup> For example, compared to those covered by private health insurance, those with Medicaid coverage or those who were uninsured were less likely to receive intervention during childbirth (cesarean delivery, labor induction, and episiotomy).<sup>36</sup> Health insurance coverage has also been found to be associated with an increase in use of prenatal care, which can reduce the likelihood of adverse birth outcomes.<sup>37</sup>

Across the Boston UIH service area, rates of payment for birth through Medicaid and private insurance were statistically significantly different between AI/AN and NHW women (Figure 17). Approximately 27.7% AI/AN births were paid by Medicaid, whereas only 12.6% of NHW births were paid by Medicaid. In contrast, 84.6% of NHW births were covered by private health insurance compared to 66.8% of AI/AN births.



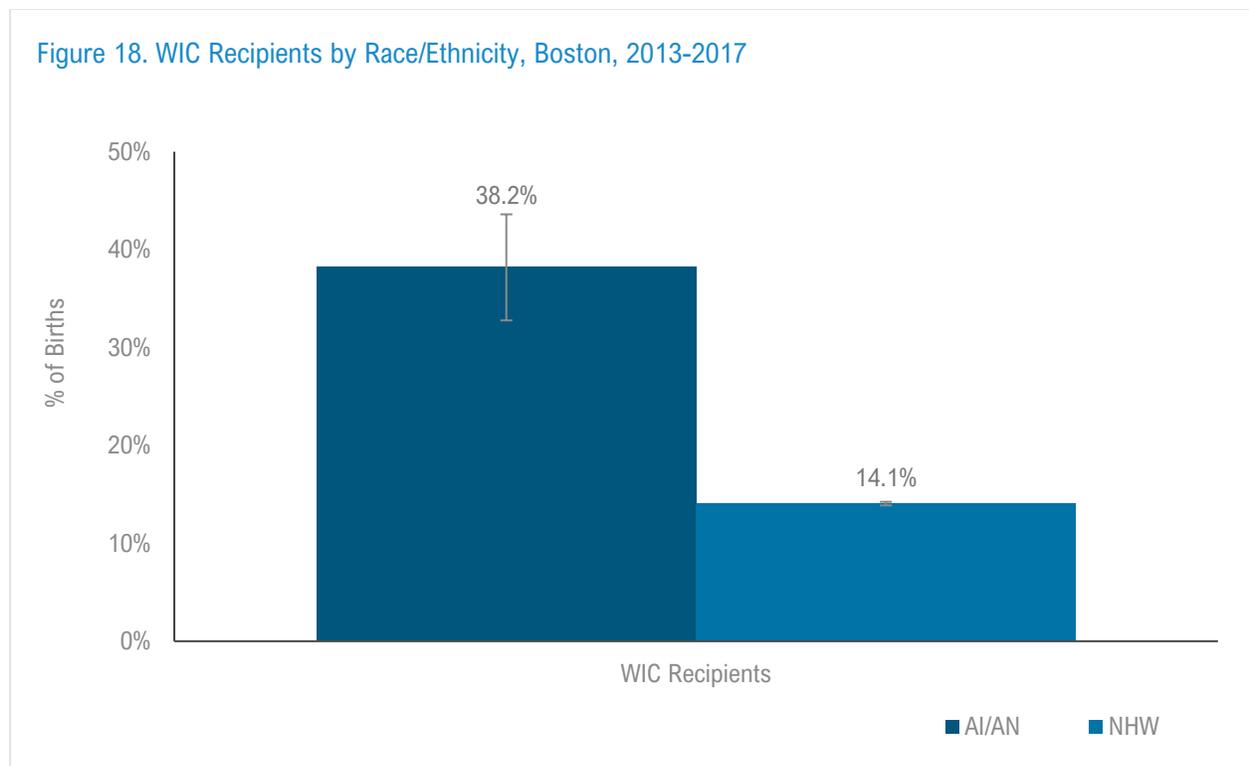
Source: National Vital Statistics, Birth Certificates, 2013-2017

\* Suppressed data < 10.

## Women, Infants, and Children Status

Women, Infants, and Children (WIC) is a federal program that provides supplemental food to low-income pregnant, post-partum, and breastfeeding women. AI/AN people often experience food insecurity, high rates of hunger, and malnutrition, which increases likelihood of participating in WIC services.<sup>38,39</sup> Food insecurity has been found to have numerous effects on health outcomes, such as birth defects, anemia, and cognitive problems.<sup>13</sup> For that reason, participation in WIC services can be a protective factor for these adverse health outcomes.

Across the Boston UIH service area, 38.2% of pregnant AI/AN women reported receiving WIC services prior to birth, compared to 14.1% of NHW women (Figure 18). AI/AN mothers were 2.7 times as likely as NHW women to have accessed these vital services.

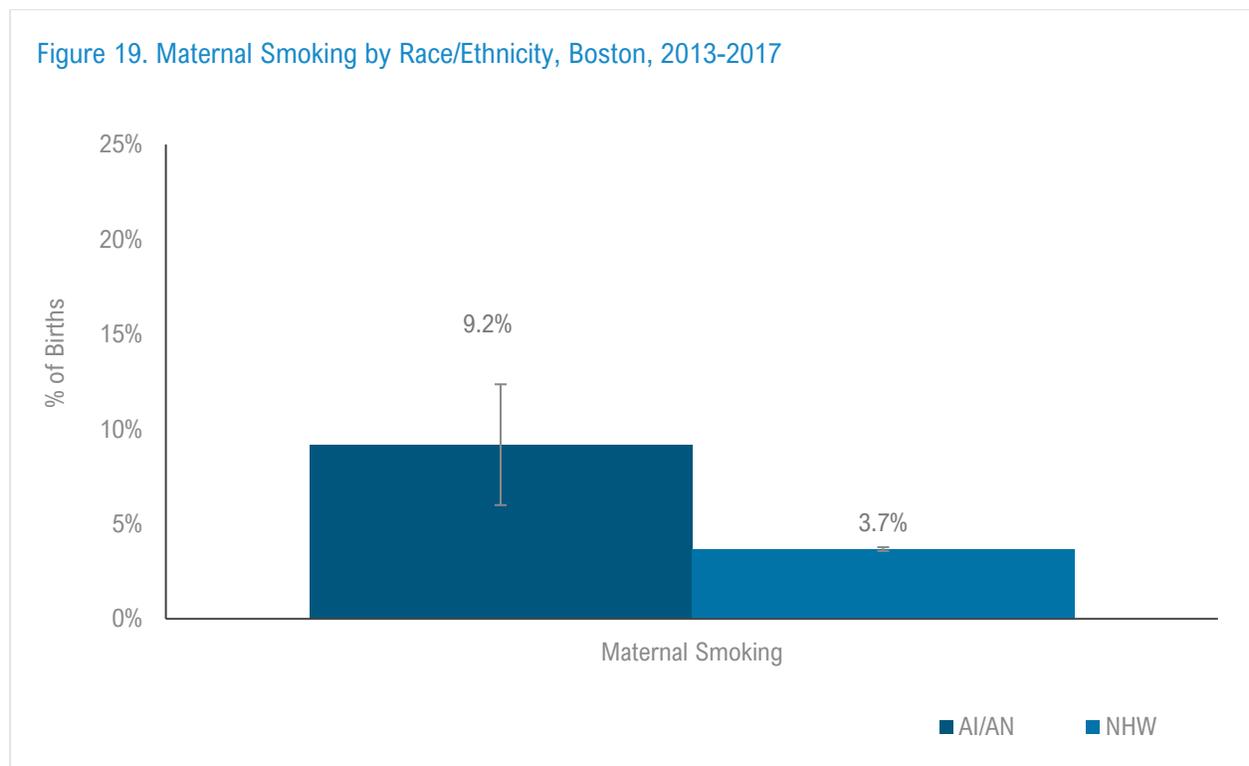


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Maternal Smoking

There are many negative infant and child outcomes linked to maternal tobacco use during pregnancy.<sup>40</sup> These negative outcomes include low birthweight, preterm birth, and various birth defects.<sup>40,41</sup> Of racial and ethnic groups, AI/AN women had the highest prevalence of smoking during pregnancy.<sup>40</sup> This disparity can be attributed to a difference in access to resources and tobacco advertising that target these communities.<sup>42</sup>

Across the Boston UIH service area, 9.2% of AI/AN women smoked while pregnant, compared to 3.7% of NHW women (Figure 19). AI/AN women were 2.5 times as likely as NHW women to smoke while pregnant.

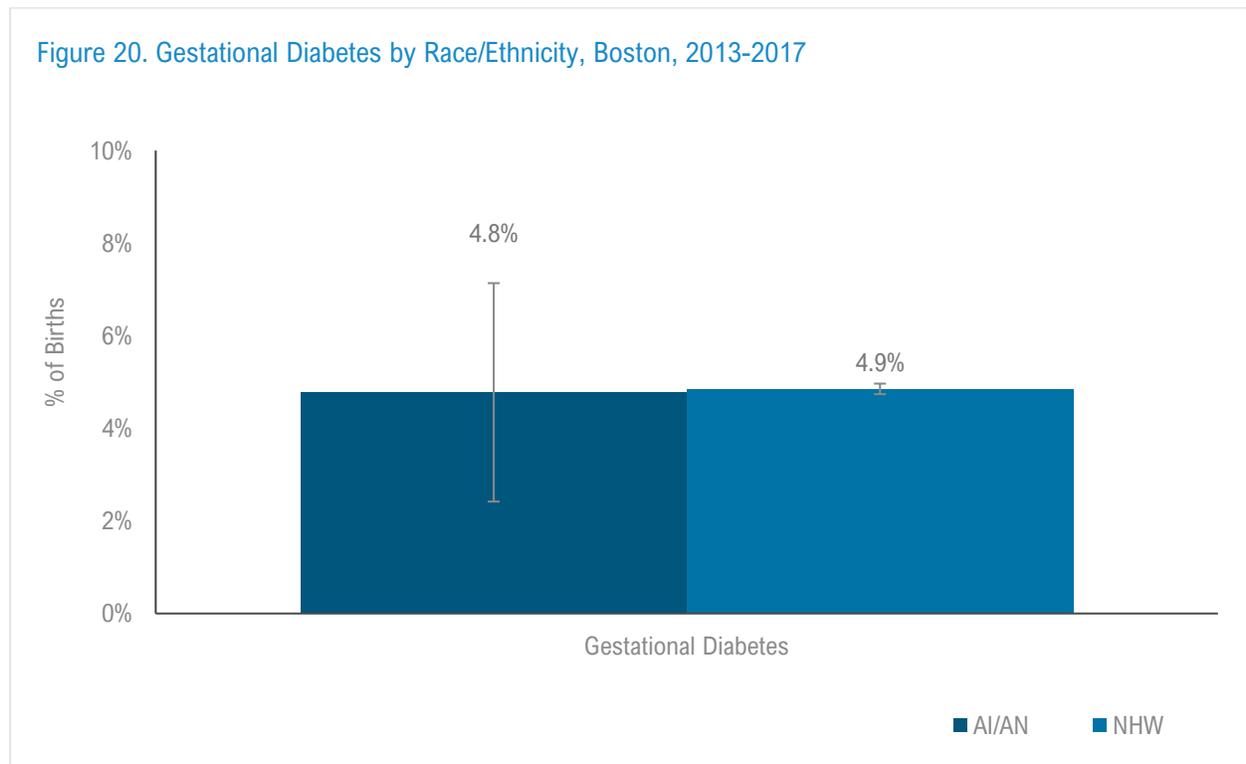


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Gestational Diabetes

Every year in the U.S., 2–10% of pregnancies are affected by gestational diabetes.<sup>43</sup> Gestational diabetes can increase the risk of high blood pressure during pregnancy as well as the likelihood of a high birthweight baby that will need to be delivered by cesarean section.<sup>43</sup> A lack of access to prenatal care and screening services contributes to disparities in gestational diabetes seen across racial groups.<sup>44</sup> Age of a pregnant person can increase their risk of developing gestational diabetes during a pregnancy. The risk of gestational diabetes tends to increase as the age of the pregnant person increases.<sup>45</sup>

Across the Boston UIH service area, approximately 4.8% of AI/AN births were to women who were diagnosed with gestational diabetes during their pregnancy (Figure 20). This proportion was not statistically significantly different from the proportion for NHW women, among whom 4.9% were diagnosed with gestational diabetes. AI/AN pregnant women were equally as likely as NHW women to be diagnosed with gestational diabetes.

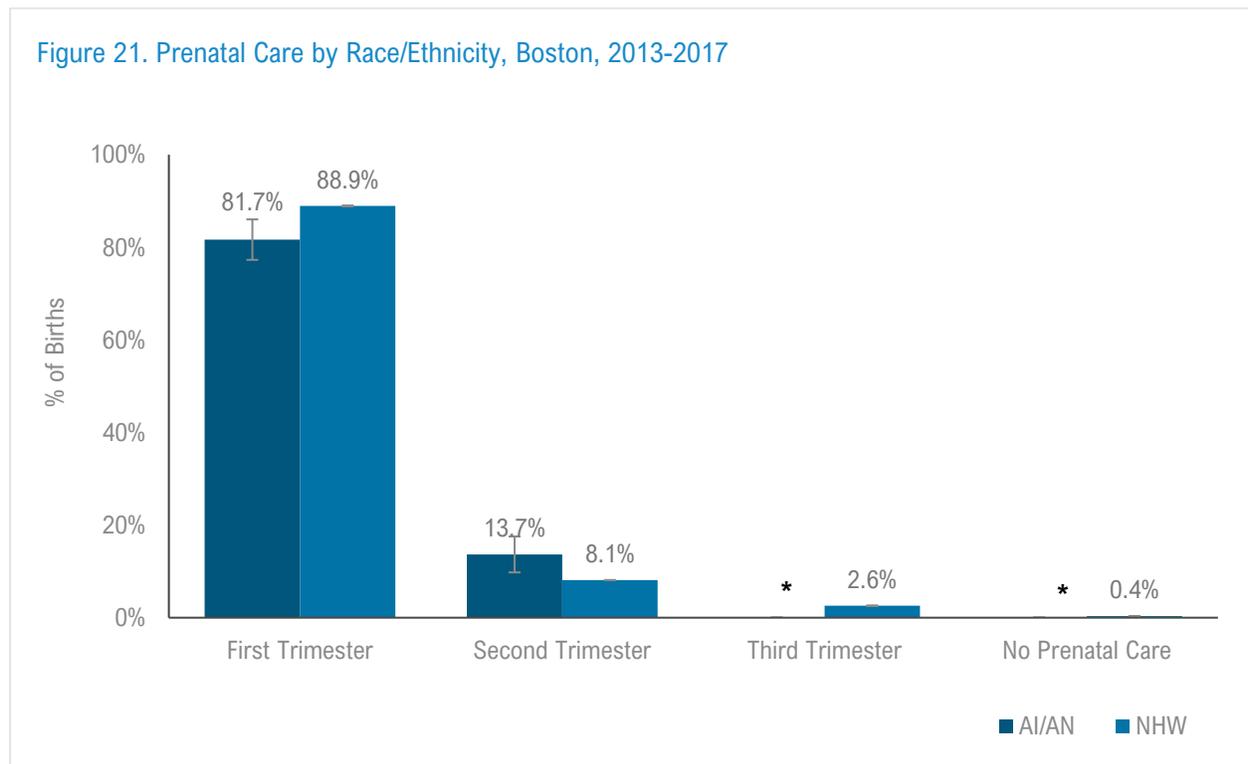


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Prenatal Care

Prenatal care refers to the medical attention received by women before or during their pregnancy. Early prenatal care is a significant component in ensuring a healthy pregnancy.<sup>46</sup> Women who receive late or no prenatal care are at risk for having undetected complications during their pregnancy that can result in severe maternal morbidity and mortality and serious consequences to the unborn infant including low birthweight, preterm birth, and morbidity, and mortality.<sup>46</sup> In addition, a lack of access, knowledge of resources and other social and structural barriers can also prevent utilization of prenatal care.<sup>47,48</sup> Disparities in prenatal care for AI/ANs varies by region and state.<sup>49</sup>

Among pregnant women within the Boston UIH service area, 81.7% of AI/AN women began prenatal care in the first trimester compared to 88.9% of NHW women, a statistically significant difference (Figure 21). The proportion of pregnant AI/AN women who began prenatal care in the third trimester or received no prenatal care was 1.5 times that of pregnant NHW women.



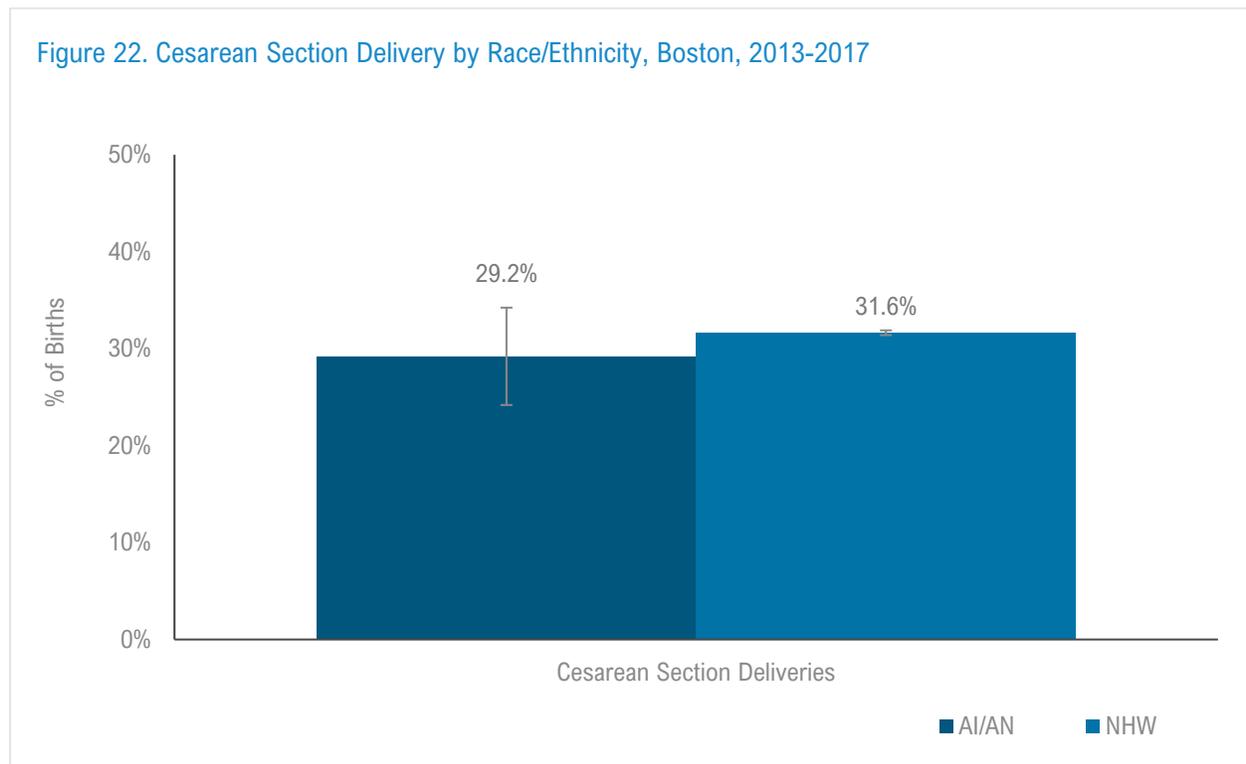
Source: National Vital Statistics, Birth Certificates, 2013-2017

\* Suppressed data < 10.

## Cesarean Section

Cesarean sections can often be a life-saving intervention when necessary. This procedure can also lead to longer hospital stays and higher costs.<sup>50</sup> While cesarean sections can prevent maternal and infant mortality and morbidity, there is little to no advantage for women who have the procedure electively.<sup>51,52</sup> Cesarean sections are associated with both short- and long-term risks that come along with a major surgery such as infection, blood loss, and damage to organs.<sup>53-55</sup> The incidence of severe complications from cesarean sections increases significantly in those over the age of 35.<sup>56</sup> Moreover, the rate of cesarean sections has only increased among the general population, therefore we need to understand the disparities between the women receiving this procedure.<sup>50</sup>

Across the Boston UIH service area, an estimated 29.2% of births were delivered by cesarean section among AI/AN females (Figure 22). This was not statistically significantly lower from the proportion of deliveries by cesarean section among NHW births at 31.6%.

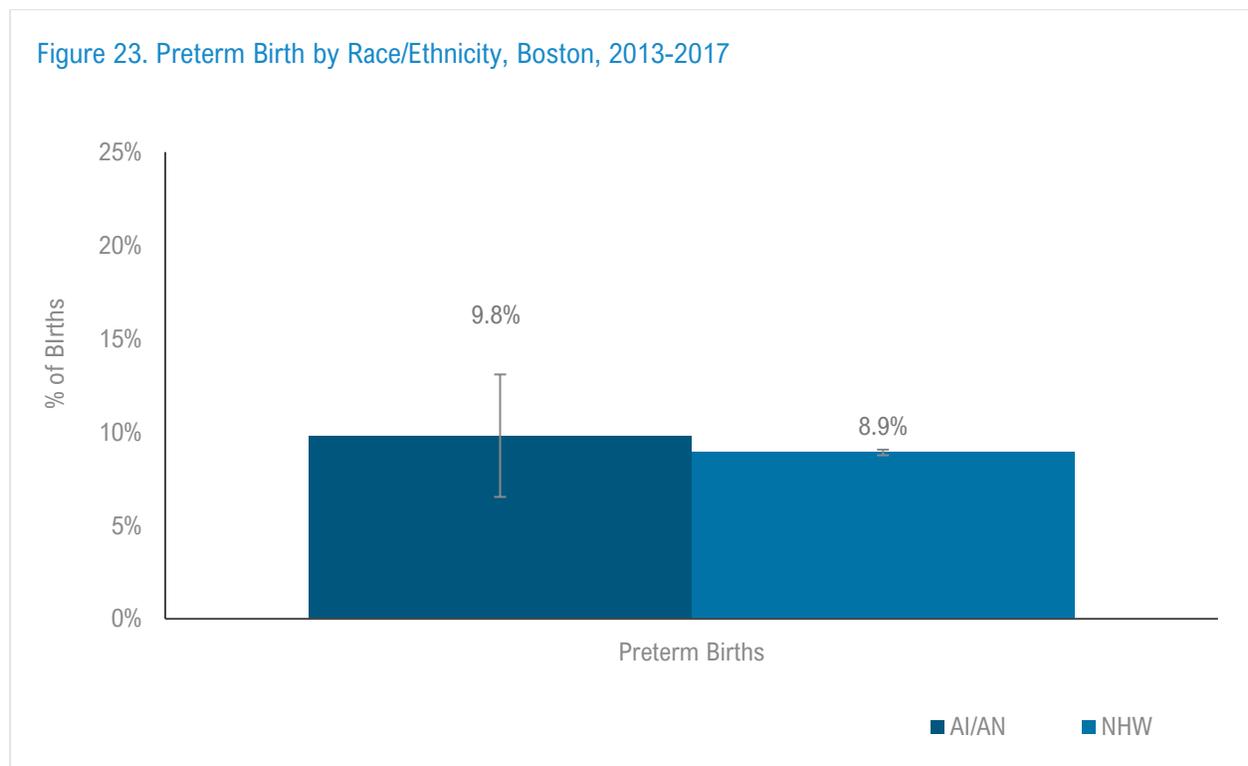


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Preterm Births

A preterm birth is defined as a birth that occurs before 37 completed weeks of pregnancy.<sup>57</sup> Preterm birth disproportionately affects AI/AN women.<sup>58</sup> Tobacco use, low socioeconomic status, low maternal age, and single marital status put women at higher risk for having a preterm delivery.<sup>58</sup> A factor associated with preterm birth is age—teens and women over 35 have an increased likelihood of preterm birth.<sup>59</sup>

Across the Boston UIH service area, 9.8% of all infants born to AI/AN women were born preterm, which was not statistically significantly higher than their NHW counterparts at 8.9% (Figure 23). Additionally, pregnant AI/AN women as likely as NHW women to give birth preterm.

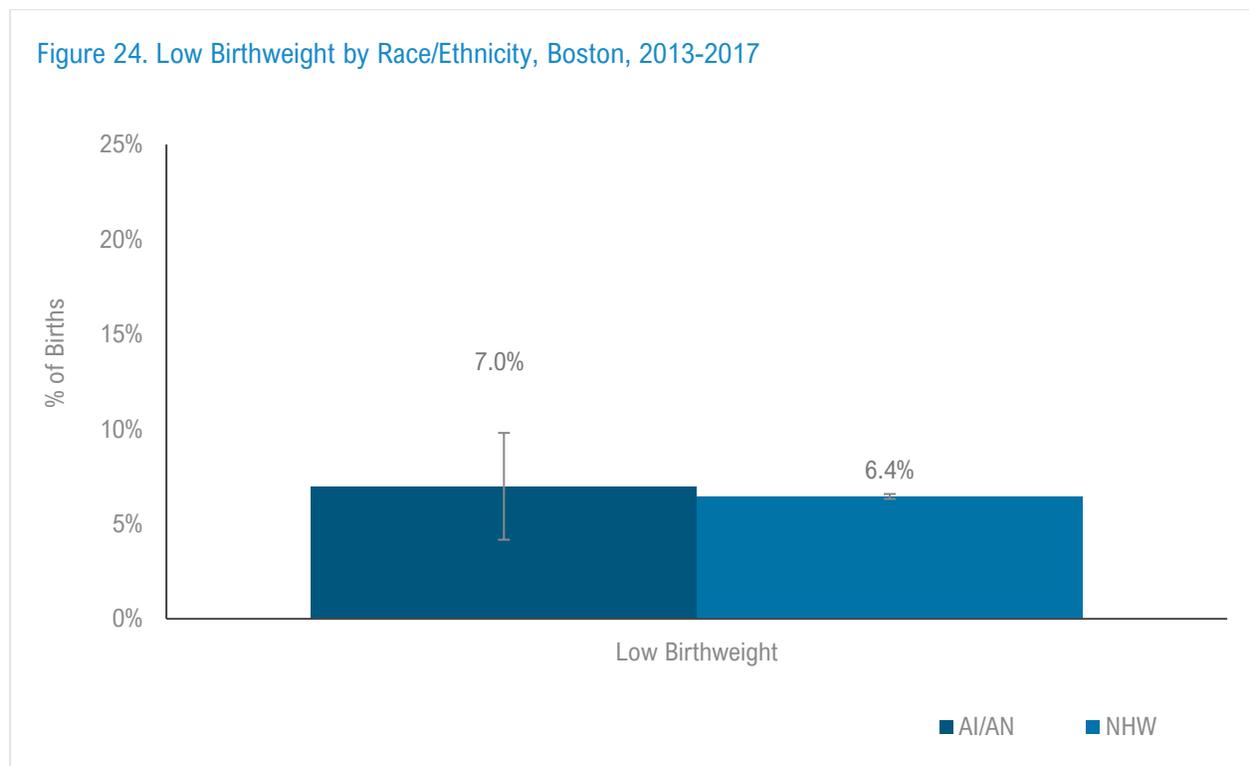


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Low Birthweight

Low birthweight is classified when a baby is born less than 2,500 grams, or 5 pounds 8 ounces.<sup>60</sup> Preterm birth can result in low birthweight. Smoking during pregnancy is also associated with an increased likelihood of low birthweight.<sup>61</sup> Additionally, it has been strongly suggested that exposure to cumulative stress such as historical trauma is associated with adverse birth outcomes.<sup>61,62</sup>

Across the Boston UIH service area, 7.0% of all infants born to AI/AN women were born at a low birthweight, which was not statistically significantly different from their NHW counterparts at 6.4% (Figure 24). Additionally, pregnant AI/AN women were as likely as NHW women to give birth to an infant at a low birthweight.

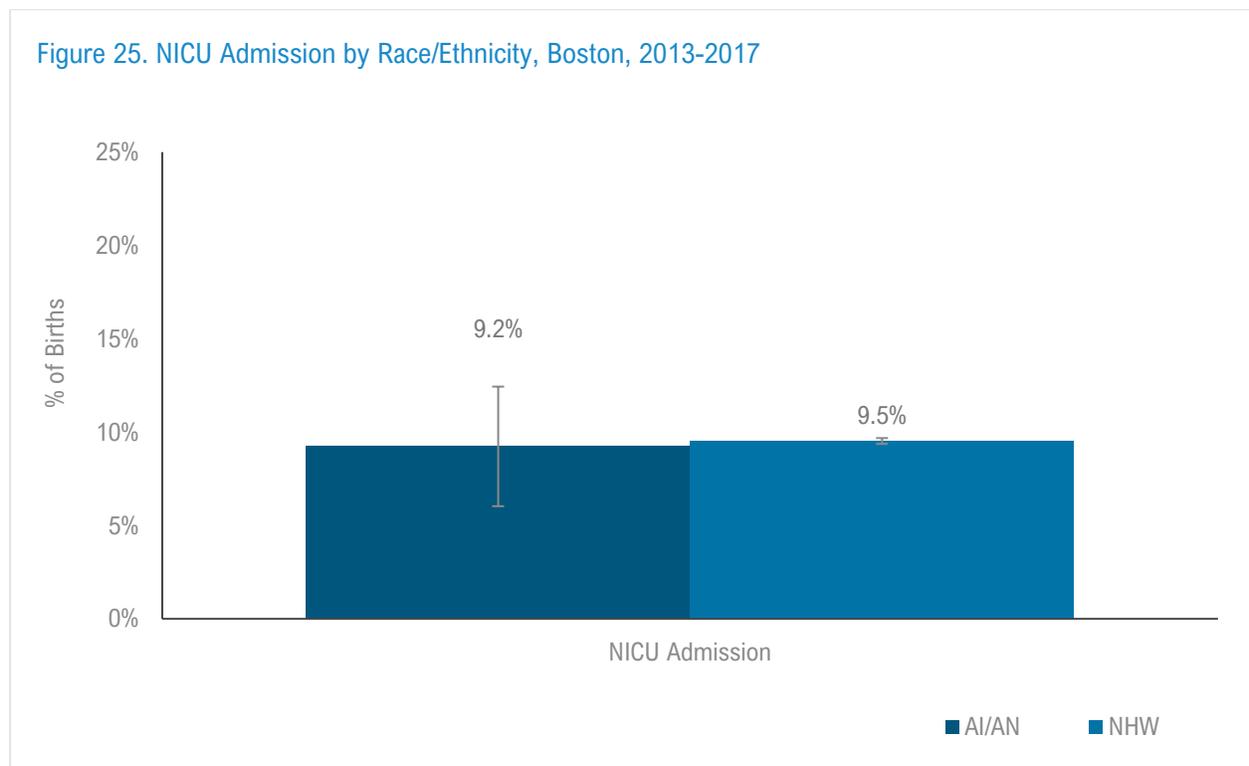


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Neonatal Intensive Care Unit Admission

The Neonatal Intensive Care Unit (NICU) is where newborn babies go when they need intensive medical care. Newborns in the NICU can be preterm, have low birthweight, or have a birth defect.<sup>63</sup> Maternal age is a factor associated with admittance to NICU.<sup>63</sup> There is increased risk for an infant to be admitted to NICU if the mother is younger than age 16 or older than age 40.<sup>63</sup>

Admission to the NICU for newborns across the Boston UIH service area was not statistically significantly different between AI/AN and NHW newborns (Figure 25). An estimated 9.2% of AI/AN newborns were admitted to the NICU compared to 9.5% NHW newborns. AI/AN newborns were as likely as NHW newborns to be admitted to the NICU.

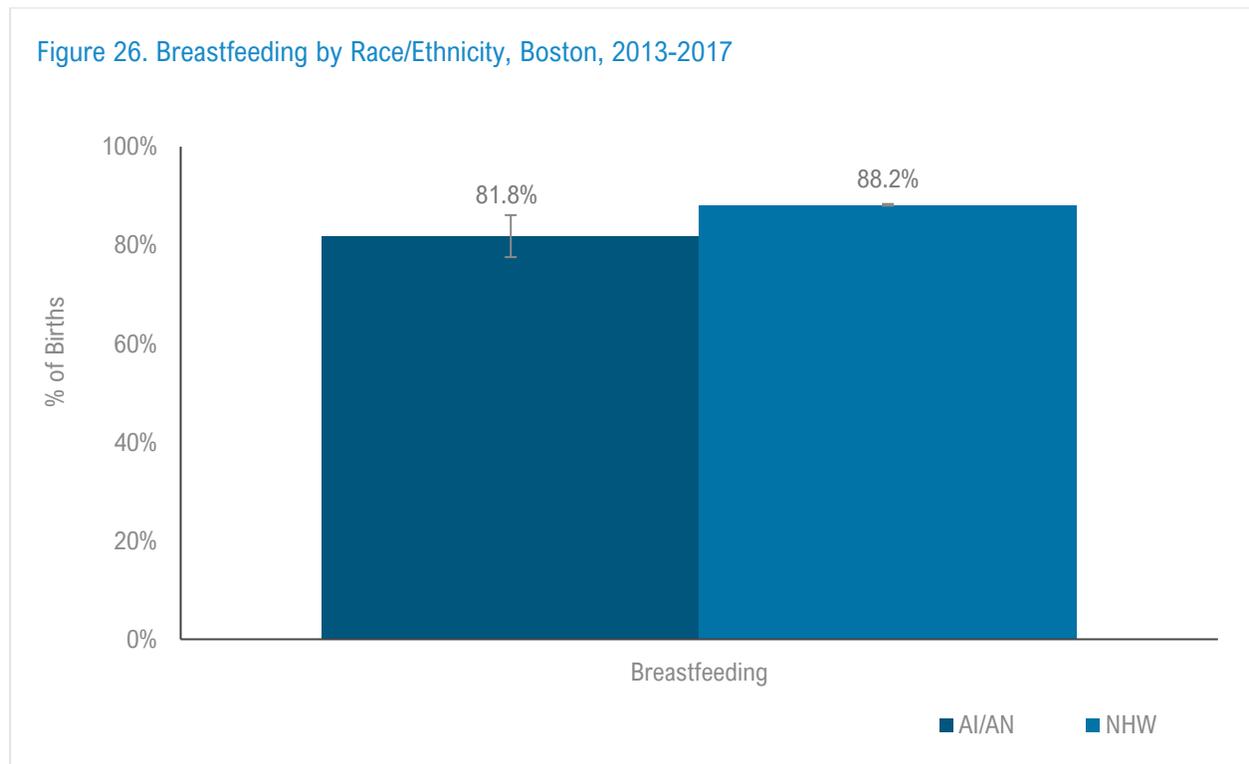


Source: National Vital Statistics, Birth Certificates, 2013-2017

## Breastfeeding

Breastfeeding has been viewed as a way to nourish a baby’s mind, body, and spirit.<sup>64</sup> Breastfeeding is an important way for infants to get nutrition in the first six months of their life and is tailored to the needs of the infant.<sup>65</sup> Benefits of breastfeeding for the infant include a lower risk of asthma, obesity, ear and respiratory infection, sudden infant death syndrome (SIDS), and gastrointestinal infections.<sup>65</sup>

Across the Boston UIH service area, 81.8% of infants born to AI/AN women were breastfeeding at the time of discharge from the hospital, compared to 88.2% of infants born to NHW women (Figure 26). This was a statistically significant difference.



Source: National Vital Statistics, Birth Certificates, 2013-2017

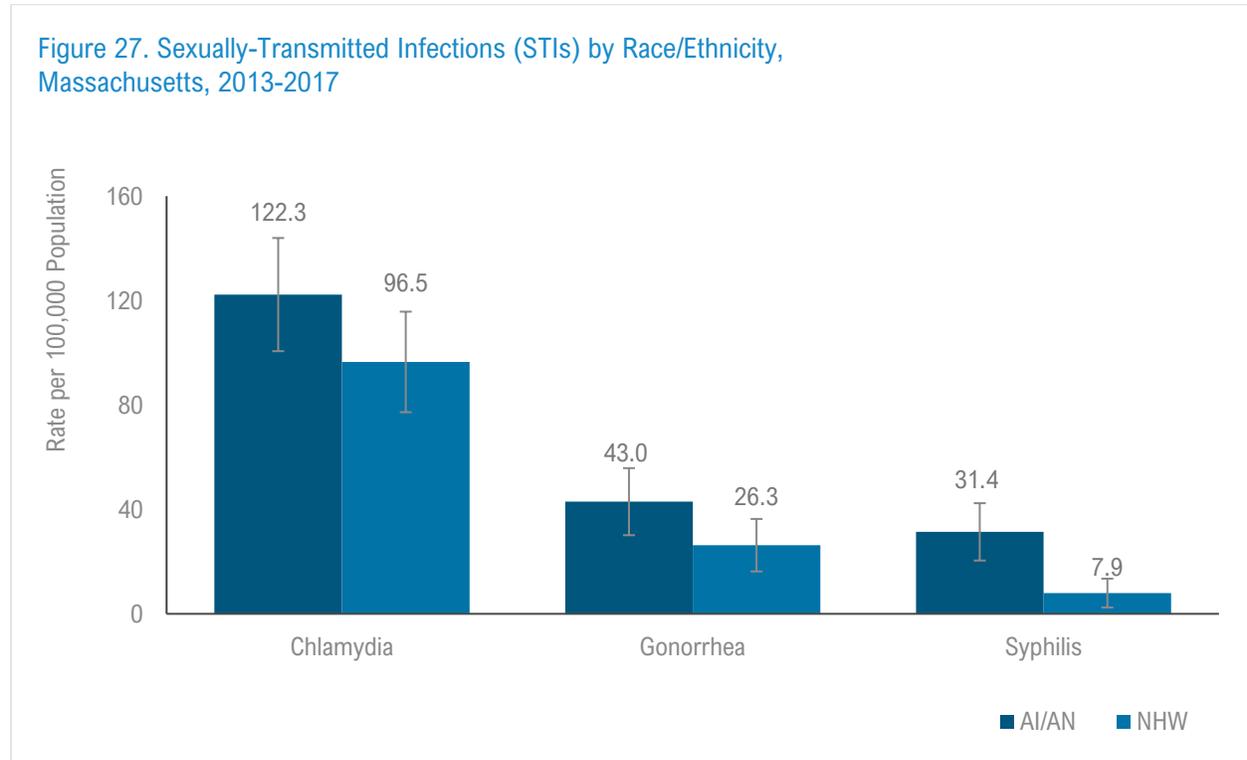


# SEXUALLY TRANSMITTED INFECTIONS

With an estimated 20 million new infections occurring each year, STIs represent a significant public health challenge across all communities in the United States.<sup>68</sup> AI/ANs experience disproportionately high rates of STIs, with rates of STIs in AI/AN communities 2–6 times greater than among NHWs. Left untreated, many STIs can lead to significant health impacts including blindness, stroke, heart disease, ectopic pregnancies, miscarriage, stillbirth, and early infant death.<sup>69-71</sup>

Due to a limitation of the data, STI estimates represent the state where UIH service areas are located, as estimates were not available at the county level.

Within the state of Massachusetts in 2013-2017, the rate of Syphilis was statistically significantly higher among AI/AN people than NHW people (Figure 27). The rate of chlamydia among the AI/AN population (122.3 cases per 100,000) was 1.3 times that of the NHW population (96.5 cases per 100,000). The rate of gonorrhea among the AI/AN population (43.0 cases per 100,000) was 1.6 times that of the NHW population (26.3 cases per 100,000). The rate of syphilis among the AI/AN population (31.4 cases per 100,000) was 4 times that of the NHW population (7.9 cases per 100,000).

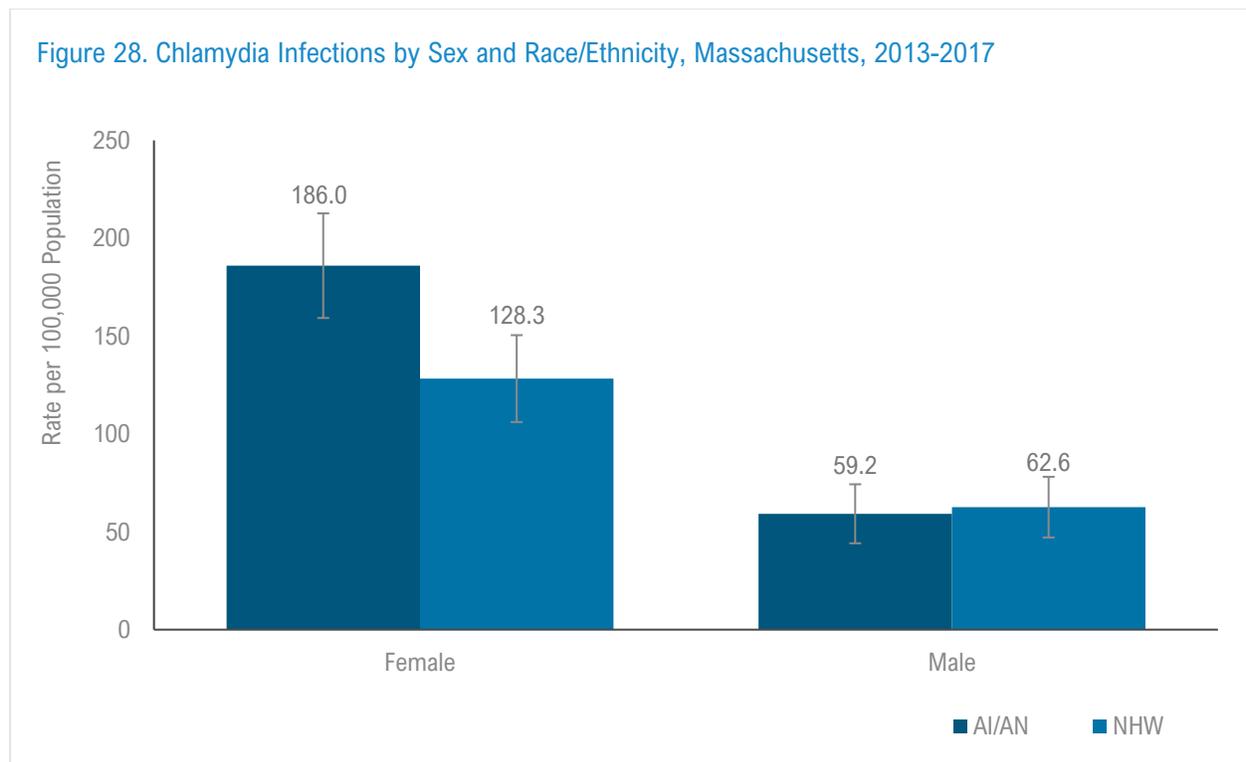


Source: National Notifiable Disease Surveillance System, 2013-2017

## Chlamydia

Chlamydia is the most common STI in the United States. It is a bacterial STI that is often asymptomatic and underreported.<sup>68</sup> Disparities in chlamydia infections between AI/AN and NHW individuals is likely due to the many structural and social factors afflicting Native communities, including historical and ongoing trauma, lack of access to healthcare and screening services, poverty, and geographic isolation.<sup>68,72</sup> Due to the asymptomatic nature of chlamydia, both screening and treatment are essential to preventing and controlling its spread.<sup>73</sup> Untreated chlamydia can further spread the infection in a community, lead to permanent damage of an individual's reproductive organs, and cause pregnancy complications.<sup>73</sup> Serious, untreated cases can even result in infertility.

The rate of chlamydia infection among AI/AN females in Massachusetts (186.0 cases per 100,000) was statistically significantly higher than among NHW females (128.3 cases per 100,000) and was 3.1 times that of AI/AN males (59.2 cases per 100,000; Figure 28). NHW females had a rate of chlamydia infection that was 2 times that of NHW males (62.6 cases per 100,000 population). The rate of chlamydia infection among AI/AN males was 94.6% that of NHW males; the difference between the two groups was not statistically significant.

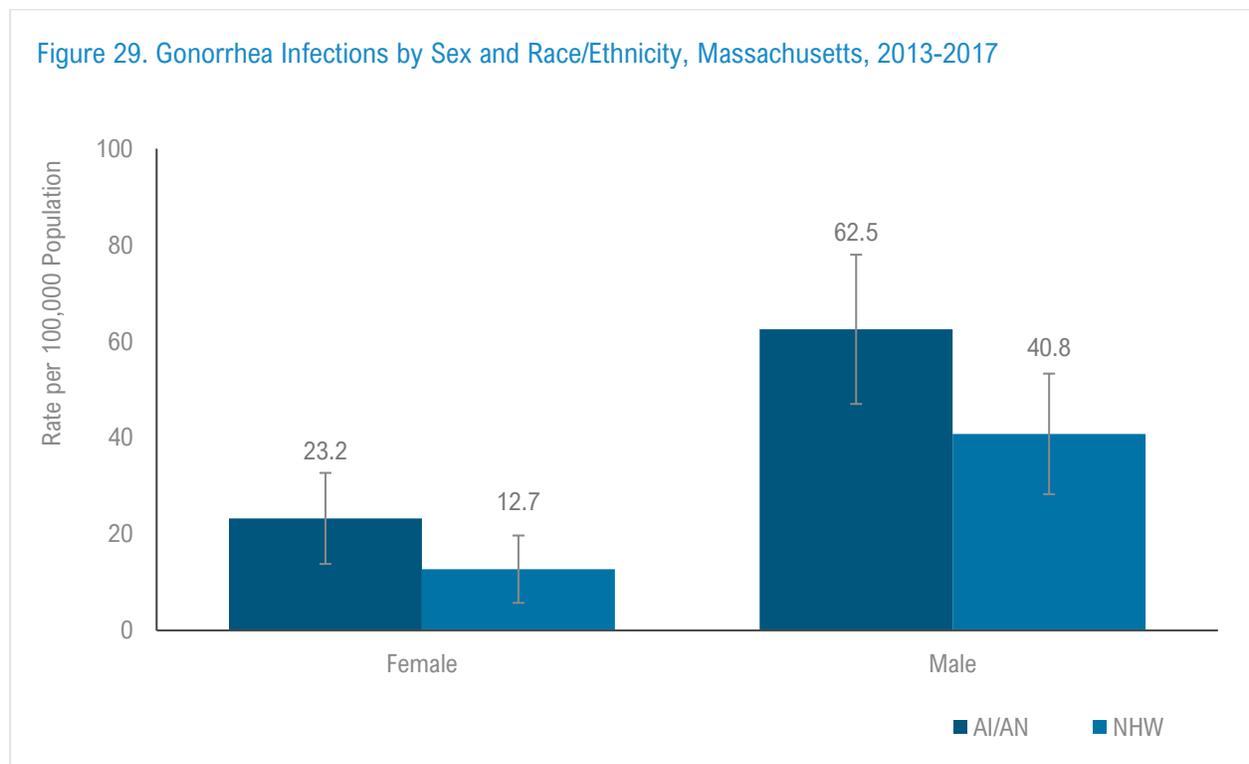


Source: National Notifiable Disease Surveillance System, 2013-2017

## Gonorrhea

In the U.S., cases of gonorrhea increased by 67% between 2013 and 2017.<sup>69</sup> Gonorrhea is a bacterial STI that is often asymptomatic. When left untreated, it can cause serious complications such as pelvic pain, ectopic pregnancy, and infertility.<sup>70</sup> Untreated gonorrhea can also increase the risk of HIV transmission.<sup>70</sup> Although it is currently treatable with antibiotics, gonorrhea has become progressively more resistant to multiple antibiotics over the past three decades. Consequently, there is a need for robust public health monitoring and response to prevent the spread of these emerging resistant strains.<sup>70</sup>

The rate of gonorrhea infection among AI/AN females in Massachusetts (23.2 cases per 100,000) was not statistically significantly higher than that of NHW females (12.7 cases per 100,000) and was 37% that of AI/AN males (62.5 cases per 100,000; Figure 29). NHW females had a rate of gonorrhea infection that was 31.1% that of NHW males (40.8 cases per 100,000 population). The rate of gonorrhea infection among AI/AN males was 1.5 that of NHW males, though this was not a statistically significant difference.



Source: National Notifiable Disease Surveillance System, 2013-2017

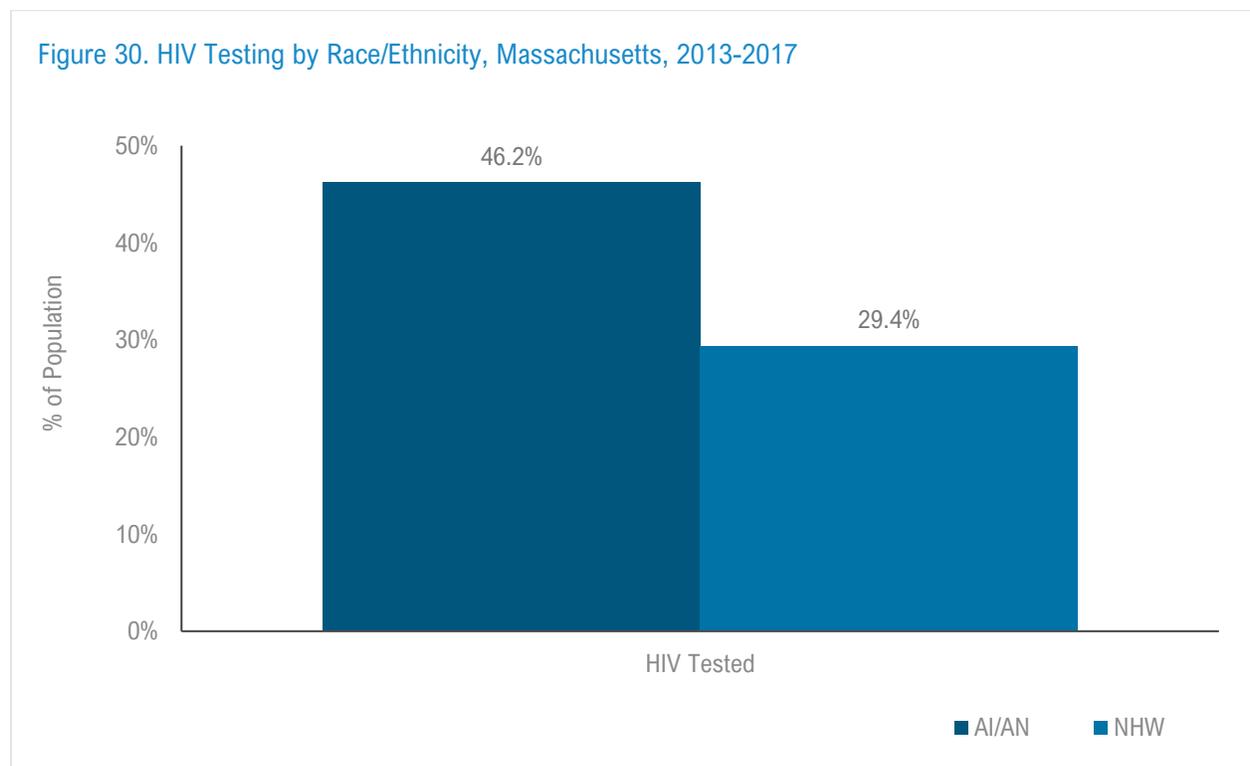
## Syphilis

Syphilis is a serious STI caused by a bacterial infection.<sup>71</sup> Syphilis is divided into stages: primary stage, secondary stage, latent stage, and tertiary stage. Early symptoms are often minor but, if left untreated, can cause severe medical problems such as paralysis, dementia, and death.<sup>71</sup> Due to the underreporting of syphilis, the numbers recorded are likely an undercount of the true number of cases, even as the U.S. has reported for 2017 its highest rate of syphilis since 1993.<sup>74</sup> Incidence of syphilis in the U.S. varies by racial and ethnic groups, which is likely a reflection of the social determinants of health that contribute to syphilis presence in a community.<sup>75</sup>

## HIV Screening

Human Immunodeficiency virus (HIV) remains a pressing public health threat throughout marginalized communities. It is estimated that 3,000 AI/AN people are living with HIV.<sup>74</sup> Both structural and environmental factors contribute to increased risk of HIV infection, including environmental resources, access to care, stigma, and economic status.<sup>75</sup> Among the general U.S. population, about 1 in 7 individuals with HIV do not know they are positive.<sup>76</sup> It is important for individuals to get tested and to start treatment as soon as possible, if necessary.

Within the state of Massachusetts, 46.2% of AI/AN individuals reported ever having been screened for HIV (Figure 30). This response was 1.6 times that of NHW individuals surveyed (29.4%).



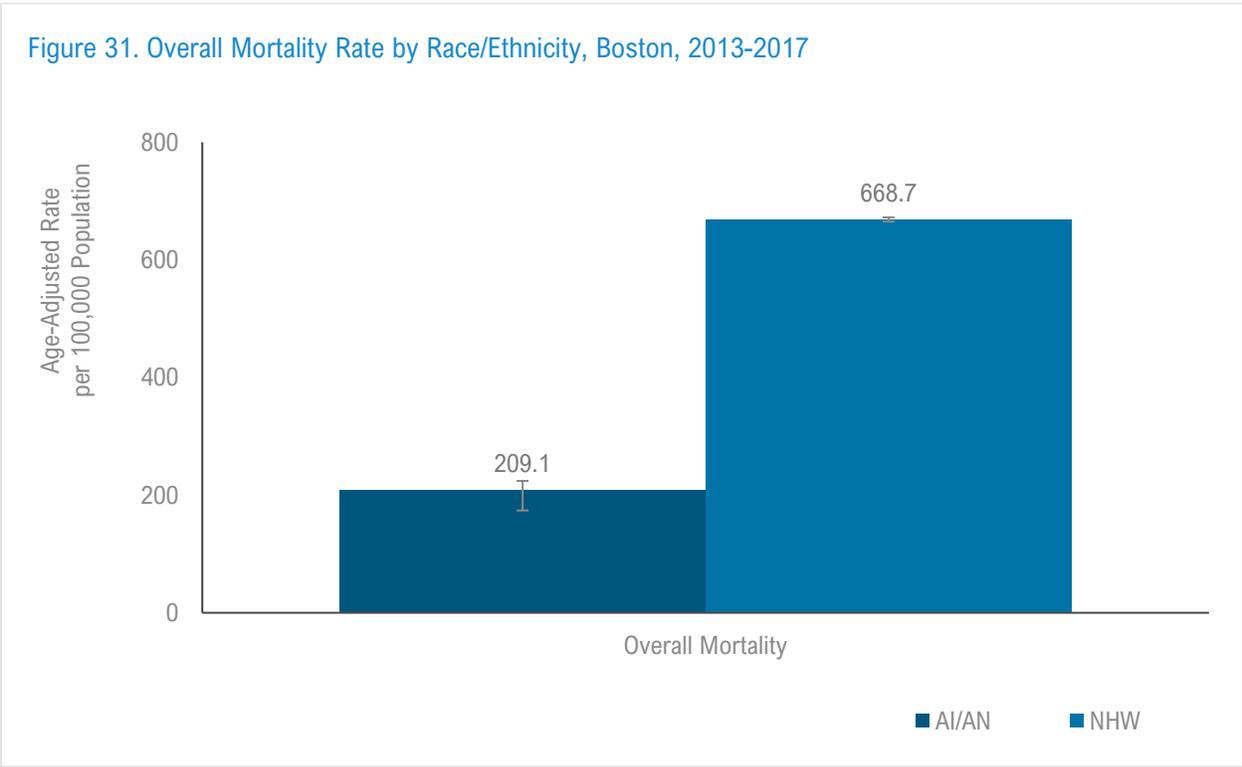
Source: Behavioral Risk Factor Surveillance System, 2013-2017



# MORTALITY

Mortality data provide an indication of a community's or population's health and socioeconomic development status.<sup>77,78</sup> Mortality data are also a key component to understanding population size and future growth. Examining mortality data is one way to measure the burden of disease in a community or population.<sup>78</sup> Tracking death rates may identify groups that are at an increased risk of premature death and may identify specific underlying causes of death that are more prevalent in certain populations. In addition, high mortality rates may indicate an issue with environmental, risk, and/or socioeconomic factors as well as communicable diseases.

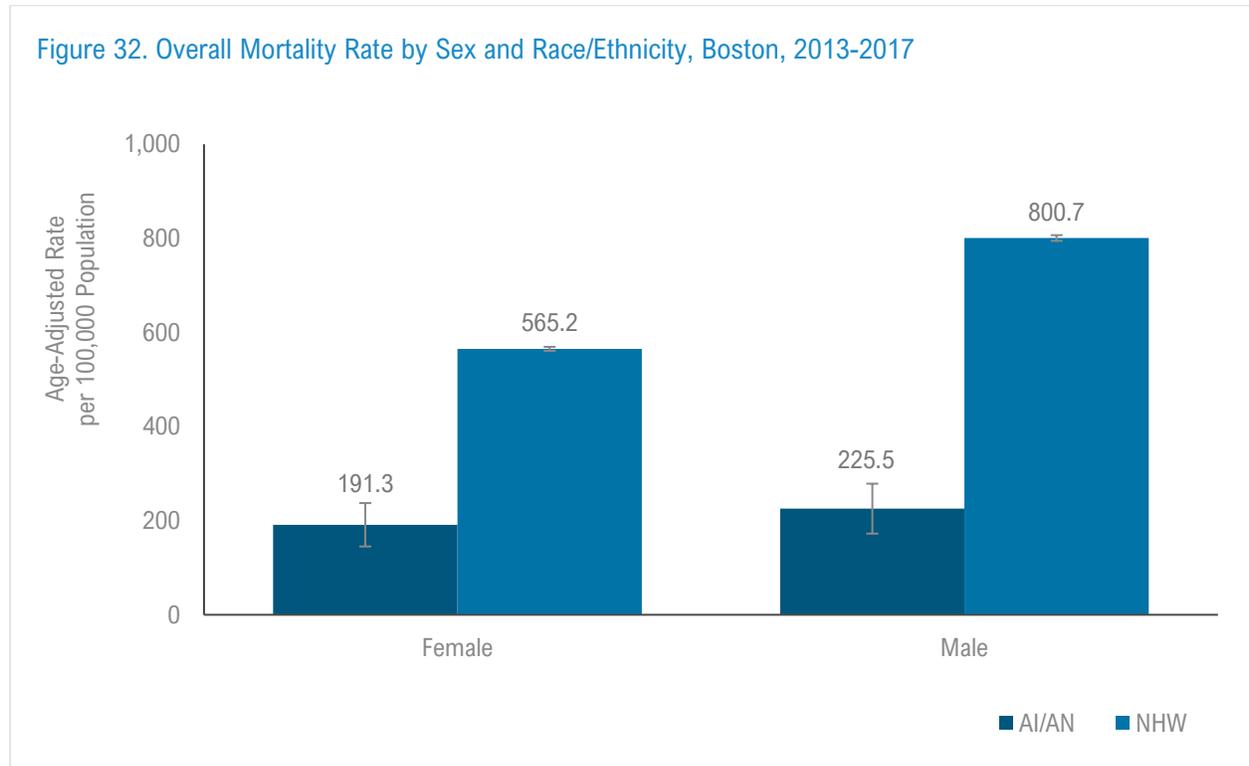
From 2013-2017, there were a total of 152 deaths among the AI/AN population in the Boston UIH service area compared to 145,569 deaths among the NHW population in the same area. The age-adjusted all-cause mortality rate for the AI/AN population was approximately 68.7% lower than the mortality rate of the NHW population (209.1 deaths per 100,000 vs 668.7 deaths per 100,000, respectively), a statistically significant difference (Figure 31).



Source: National Vital Statistics, Death Certificates, 2013-2017

## All-cause Mortality by Sex

The mortality rates for both males and females were statistically significantly lower among the AI/AN population compared to their NHW counterparts in the Boston UIH service area (Figure 32). The mortality rate for AI/AN males was 71.8% lower than NHW males (225.5 deaths per 100,000 vs 800.7 deaths per 100,000, respectively). AI/AN females (191.3 deaths per 100,000) had a 66.2% lower mortality rate than NHW females (565.2 deaths per 100,000). Additionally, the mortality rate for AI/AN females was 15.2% lower than AI/AN males.



Source: National Vital Statistics, Death Certificates, 2013-2017

## Top Causes of Mortality

Mortality rates often reflect the influence of environments, risk factors, socioeconomic status, and communicable diseases.<sup>83</sup> Understanding the top underlying causes of mortality can inform disease prevention goals, priorities, and strategies.<sup>83</sup>

AI/AN people had the same top three causes of mortality as NHW people, these being vascular disease, cancer, and unintentional injuries. The rate of mortality due to vascular disease for AI/AN people (55.1 deaths per 100,000) was 31.6% that of NHW people (174.2 deaths per 100,000d; Table 1). Additionally, the rate of mortality due to cancer for AI/AN people (40 deaths per 100,000) was 25.9% that of NHW people (154.7 deaths per 100,000). Lastly, the rate of mortality due to unintentional injuries among AI/AN people (16.4 deaths per 100,000) was 35.0% that of NHW people (46.8 deaths per 100,000).

**Table 1. Top Causes of Mortality, Boston, 2013-2017**

AI/AN			NHW		
Rank	Cause	Rate (per 100k)	Rank	Cause	Rate (per 100k)
1	Vascular Disease	55.1	1	Vascular Disease	174.2
2	Cancer	40.0	2	Cancer	154.7
3	Unintentional Injuries	16.4	3	Unintentional Injuries	46.8
4	*	*			
5	*	*			

\* Suppressed data < 10.

Source: National Vital Statistics, Death Certificates, 2013-2017

Deaths due to unintentional injury are categorized by individual cause of death in analysis of leading causes.

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# APPENDIX A

## Sociodemographic Indicators among AI/AN (alone) in Boston Service Area vs. All Service Areas

	AI/AN (alone) in Boston	AI/AN in All UIO Service Areas
<b># Individuals</b>	<b>8,395</b>	<b>767,432</b>
<b>% of Population</b>	<b>0.2%</b>	<b>0.8%</b>
<b>Age (% of Population)</b>		
0-4	5.8%	7.0%
5-14	15.0%	15.0%
15-24	18.4%	16.4%
25-34	14.8%	16.1%
35-44	12.2%	13.4%
45-54	14.5%	12.9%
55-64	10.0%	10.7%
65-74	6.9%	5.6%
75-84	1.5%	2.1%
85+	0.8%	0.8%
<b>Sex (% of Population)</b>		
Female	49.5%	51.1%
Male	50.5%	48.9%
<b>Poverty (% of Population)</b>		
Children	17.7%	30.5%
Individuals	19.7%	24.5%
Families	23.3%	20.3%
Single Mother Families	31.8%	31.0%
<b>SNAP Recipients (% of Population)</b>		
All	32.5%	23.6%
<b>Housing Tenure (% of Households)</b>		
Owner Occupied	33.8%	45.3%
Renter Occupied	66.2%	54.7%
<b>No Health Insurance (% of Population)</b>		
All	3.7%	19.7%
Age: 0-18	0.2%	12.6%
Age: 19-64	5.7%	25.3%
Age: 65+	*	2.5%

\* Suppressed data < 10.

Source: American Community Survey, 2013-2017

	AI/AN (alone) in Boston	AI/AN in All UIO Service Areas
<b>Disability (% of Population)</b>		
Age: 0-17	4.2%	4.7%
Age: 18-64	15.9%	15.5%
Age: 65+	61.3%	46.0%
<b>Education (% of Population 25 years and older)</b>		
Less than High School	17.5%	20.5%
High School Diploma or GED	31.9%	28.2%
Some College or Associate Degree	26.5%	34.7%
Bachelor Degree or Higher	24.1%	16.6%
<b>Unemployed (% of Population 16 years and older)</b>		
All	7.2%	11.2%
<b>Commute Type (% of Employed Population 16 years and older)</b>		
Car/Truck/Van Alone	51.9%	67.9%
Carpool	11.9%	12.8%
Public Transport	20.5%	8.5%
Taxi/Bike/Other	5.8%	3.0%
Walked	6.7%	3.8%
Worked at Home	3.2%	3.9%

\* Suppressed data < 10.

Source: American Community Survey, 2013-2017

# APPENDIX B

## Maternal and Child Health Indicators among AI/AN in Boston Service Area vs. All Service Areas

	AI/AN in Boston		AI/AN in All UIO Service Areas	
	%	(95% CI)	%	(95% CI)
# of Births	316		47,556	
% of All Births	0.1%	(0.1% - 0.1%)	0.8%	(0.8% - 0.8%)
<b>Maternal Age (% of Births)</b>				
19 years or less	5.7%	(3.1% - 8.3%)	9.3%	(9.0% - 9.5%)
20-29 years	40.2%	(34.8% - 45.6%)	56.9%	(56.5% - 57.4%)
30-39 years	50.0%	(44.5% - 55.5%)	31.6%	(31.2% - 32.0%)
40 plus years	4.1%	(1.9% - 6.3%)	2.2%	(2.1% - 2.3%)
<b>Marital Status (% of Births)</b>				
Married	54.1%	(48.6% - 59.6%)	33.9%	(33.5% - 34.3%)
<b>Maternal Education (% of Births)</b>				
Less than High School	7.9%	(4.9% - 10.9%)	19.1%	(18.7% - 19.4%)
High School Diploma or GED	20.6%	(16.1% - 25.0%)	29.6%	(29.2% - 30.0%)
Some College or Associate Degree	32.6%	(27.4% - 37.8%)	33.0%	(26.6% - 26.7%)
Bachelor Degree or Higher	35.1%	(29.9% - 40.4%)	11.9%	(11.6% - 12.2%)
<b>Primary Payment Source (% of Births)</b>				
Indian Health Services	*		6.3%	(6.0% - 6.5%)
Medicaid	27.7%	(22.6% - 32.9%)	62.5%	(62.1% - 63.0%)
Private Insurance	66.8%	(61.4% - 72.2%)	26.1%	(70.1% - 70.2%)
Self-pay	*		2.0%	(2.6% - 2.6%)
<b>WIC Status (% of Births)</b>				
All	38.2%	(32.8% - 43.6%)	52.4%	(52.0% - 52.9%)
<b>Maternal Smoking (% of Births)</b>				
All	9.2%	(6.0% - 12.4%)	9.1%	(8.9% - 9.4%)
<b>Gestational Diabetes (% of Births)</b>				
All	4.8%	(2.4% - 7.1%)	9.9%	(9.6% - 10.2%)
<b>Prenatal Care (% of Births)</b>				
First Trimester	81.7%	(77.3% - 86.0%)	64.7%	(64.3% - 65.1%)
Second Trimester	13.7%	(9.8% - 17.5%)	23.6%	(23.2% - 24.0%)
Third Trimester	*		8.4%	(8.2% - 8.7%)
No Prenatal Care	*		3.2%	(3.1% - 3.4%)
<b>Cesarean Section Delivery (% of Births)</b>				
All	29.2%	(24.2% - 34.2%)	27.7%	(27.3% - 28.1%)
<b>Preterm Birth (% of Births)</b>				
All	9.8%	(6.5% - 13.1%)	13.3%	(13.0% - 13.7%)
<b>Low Birthweight (% of Births)</b>				
All	7.0%	(4.2% - 9.8%)	7.6%	(7.4% - 7.9%)

\* Suppressed data < 10.

Source: National Vital Statistics, Birth and Death Certificates, 2013-2017

	AI/AN in Boston		AI/AN in All UIO Service Areas	
	%	(95% CI)	%	(95% CI)
<b>NICU Admission (% of Births)</b>				
All	9.2%	(6.0% - 12.4%)	10.2%	(9.9% - 10.5%)
<b>Breastfeeding (% of Births)</b>				
All	81.8%	(77.6% - 86.1%)	81.9%	(81.5% - 82.3%)
	Rate per 1,000 Live Births	(95% CI)	Rate per 1,000 Live Births	(95% CI)
<b>Infant Mortality (Rate per 1,000 Live Births)</b>				
All	*		14.2	(13.2 - 15.1)

\* Suppressed data < 10.

Source: National Vital Statistics, Birth and Death Certificates, 2013-2017

# APPENDIX C

## Sexually Transmitted Infection (STI) Indicators among AI/AN in Massachusetts vs. All Service States

	AI/AN in Massachusetts		AI/AN in All UIO Service States	
	Rate per 100,000	(95% CI)	Rate per 100,000	(95% CI)
<b>Chlamydia (Rate per 100,000 Population)</b>				
All	122.3	(100.6 - 144.0)	716.6	(664.1 - 769.0)
Female	186.0	(159.2 - 212.7)	1080.7	(1016.2 - 1145.1)
Male	59.2	(44.1 - 74.3)	341.3	(305.1 - 377.5)
<b>Gonorrhea (Rate per 100,000 Population)</b>				
All	43.0	(30.1 - 55.8)	208.5	(180.2 - 236.8)
Female	23.2	(13.8 - 32.7)	253.6	(222.4 - 284.8)
Male	62.5	(47.0 - 78.0)	162.0	(137.1 - 187.0)
<b>Syphilis (Rate per 100,000 Population)</b>				
All	31.4	(20.4 - 42.4)	13.8	(6.5 - 21.1)
	%		%	
<b>Ever HIV Tested (% of Population)</b>				
All	46.2%		39.4%	

Source: National Notifiable Disease Surveillance System, 2013-2017

# APPENDIX D

## Mortality Indicators among AI/AN in Boston Service Area vs. All Service Areas

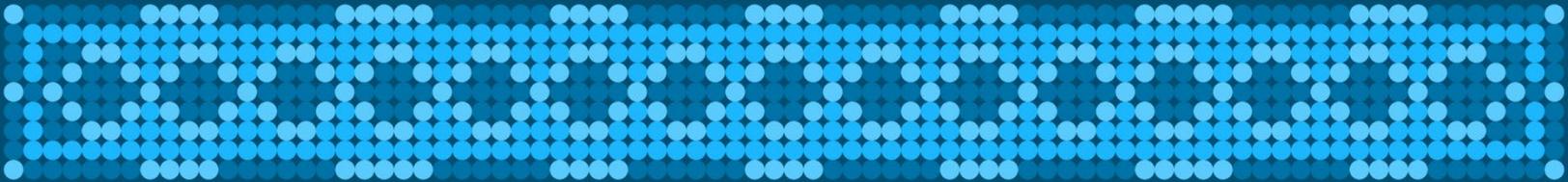
	AI/AN in Boston		AI/AN in All UIO Service Areas	
	Rate per 100,000	(95% CI)	Rate per 100,000	(95% CI)
# of Deaths	152		26,600	
<b>All Cause Mortality (Age-Adjusted Rate per 100,000 Population)</b>				
All	209.1	(174.0 - 224.2)	533.4	(526.4 - 540.4)
Female	191.3	(145.2 - 237.4)	449.9	(441.4 - 458.4)
Male	225.5	(172.5 - 278.6)	637.7	(625.7 - 649.6)
<b>Homicide Mortality (Age-Adjusted Rate per 100,000 Population)</b>				
All	*		5.7	(5.2 - 6.3)
<b>Suicide Mortality (Age-Adjusted Rate per 100,000 Population)</b>				
All	*		9.8	(9.1 - 10.6)

\* Suppressed data < 10.

Source: National Vital Statistics, Death Certificates, 2013-2017







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