Common Health for the Commonwealth

9th Edition

MASSACHUSETTS HEALTH COUNCIL

Report on Preventable Conditions and Social Determinants of Health

2017

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Message from the Executive Director and President

We proudly release the ninth edition of the Massachusetts Health Council's nationally recognized report, *Common Health for the Commonwealth: Report on Preventable Conditions and Social Determinants of Health* shines a light on the prevalence of health conditions and the social determinants of health and serves as a guide for council members to collaborate in building a culture of health in the Commonwealth. The council's goal is to have good health and well-being flourish in all Massachusetts communities.

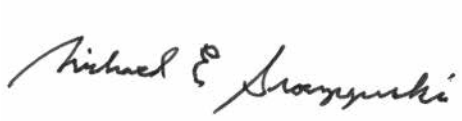
This year's report identifies many areas that demand the attention of government, civic, and business leaders.

- The report identifies several troubling trends that impact the health of school-age children: 60 percent of students drank a sweetened beverage daily with middle school students slightly more likely to consume them than high school students. High school students, however, were less likely to consume multiple servings of vegetables and fruits than middle school students.
- Massachusetts is a leader in access to health coverage but due to multiple factors, including high out-of-pocket costs, access to care is a persistent challenge for those with chronic health conditions or low incomes.
- Smoking rates among high school students have fallen dramatically over the past decade, but electronic products have largely replaced cigarettes. When vaping is included, it appears there has not been a reduction in nicotine use among high school students.
- Rates of major depressive episodes among adolescents have trended up recently in both Massachusetts and the United States, with 11 percent of Massachusetts adolescents reporting a major depressive episode in 2013–2014.

Massachusetts must come together to address these and many other issues revealed in the *Common Health Report*. Fortunately, Health Council members are already working on solutions to some of these problems. For instance, the council is part of a coalition with the American Heart Association/American Stroke Association to enact policies that discourage the consumption of sugar-sweetened beverages and make access to drinking water a public health priority. And council members are committed to ensuring that Massachusetts remains a national leader in access to health coverage and resist efforts to roll back our commitment to universal coverage while simultaneously addressing the cost of care that inhibits access for so many.

Finally, on behalf of the Health Council, we thank the many organizations that make this report possible with their generous support and thank all the individuals who authored policy perspectives for each topic. This edition of the *Common Health Report* will guide our work and collaboration over the next year to bring the conditions that enable real health to every community in Massachusetts.

Sincerely,



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The Center for Health Law and Economics (CHLE) is a unit of Commonwealth Medicine, the public service division of UMass Medical School. CHLE counsels public agencies and nonprofit health policy organizations in pursuit of an improved health care system. With collective expertise that integrates health law and health policy, CHLE helps health policy leaders transform ideas into reality by crafting inventive and sustainable solutions to systemic challenges. The investigators thank Carol Pryor for her research assistance.

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Special Thanks

We are grateful to the **Massachusetts Medical Society** for publishing the report and to its division, **NEJM Group** and the **Department of Publishing Operations**, for providing design, layout, project management, quality assurance, and printing services. The Massachusetts Health Council was founded through the efforts of the Society in 1920 and continues to enjoy its significant support.

A Note on the Data

All of the data cited in this report are publicly available; most come from reports issued by state and federal agencies. Data sources referenced in the text are cited in footnotes; full citations for the data sources for the charts are listed at the end of each section. In some cases, more than one data source exists for an indicator. Data from different sources may be based on different methods of data collection and different samples, and the questions asked or information collected may not be exactly the same. This report cites data from a variety of sources; variations in statistics for certain indicators may reflect differences among the sources.

This report highlights trends in health and health-related indicators and thus notes year-to-year changes. Not all year-to-year differences may rise to the level of statistical significance — that is, to a 95 percent level of certainty that differences are not the result of chance. This may be especially true in cases where changes are small or based on smaller sample sizes. Where possible, the report also describes multi-year trends. The annual data, combined with longer term trend data, provide a useful picture of progress in addressing some of the major factors that affect the health of Massachusetts residents.

Contributors of the Policy Perspectives include leading practitioners, researchers, and advocates in their respective fields. They have been invited to offer personal insights and recommendations for policies, programs, or funding needs to address preventable health conditions or social determinants discussed in the report. Their contributions do not necessarily reflect the opinons or positions of the Massachusetts Health Council or its Board of Directors.

Executive Summary

The ninth edition of *Common Health for the Commonwealth* updates data and trends on preventable health conditions and social factors affecting the health of Massachusetts residents. The report covers:

- Social Determinants of Health — the broad social, economic, and environmental factors — such as poverty, education, housing, and nutrition — that affect people's health;
- Health Risk Factors — individual behaviors or personal characteristics, such as tobacco use, that affect health; and
- Preventable Health Conditions — the chronic conditions (for example, asthma, obesity, oral disease) whose incidence may be reduced or managed through education, prevention, accessible and affordable treatment, and other approaches.

All of the data in the report are from publicly available sources and are presented in a way to suggest to readers of the report where action might be effective to improve the health of the Commonwealth. A brief summary of the report's content, with selected highlights of the findings, follow.

Chapter 1. Social Determinants of Health

1.1 Income and Poverty

Poverty puts people's health at risk. Even though Massachusetts has a lower poverty rate than the nation as a whole, three-quarters of a million people in the Commonwealth live below the poverty line, and more than 1.6 million have income below twice the poverty line, which is still a low enough income to affect health. Members of certain groups are at a higher risk of living in poverty, and therefore of poverty-related health deficits. These groups include children — especially those in single female-headed families — people with lower educational attainment, racial minorities, and Latinos. Many of these groups also are disproportionately affected by some of the other social determinants and risk factors discussed elsewhere in this report.

- The national poverty rate fell dramatically from 2014 to 2015; the Massachusetts rate fell slightly and, at 11.5%, is 3 percentage points below the national rate. Both rates, however, are still above 2009 levels, before the full effects of the Great Recession had been registered.
- There is a wide range of poverty rates across counties in Massachusetts — from 6.6% in Barnstable to 19.8% in Suffolk. Within counties, there is a variation in poverty rates across cities and towns as well.

1.2 Education

Educational attainment in Massachusetts varies significantly by gender, race, and other important characteristics. Educational attainment is lower for groups that also disproportionately experience other social determinants of health, amplifying health disparities. Low educational attainment affects health status, the prevalence of specific diseases and conditions, and mortality rates. Raising education levels, particularly among at-risk groups, could improve population health.

- Dropout rates have declined and graduation rates have increased over the past decade.

1.3 Housing and Homelessness

Unstable housing and homelessness have direct health effects and also indirect effects through other social determinants of health. While the number of homeless people in Massachusetts is relatively small, many of them are children — whose developmental, mental, and physical health are susceptible to stressful housing situations — and chronically homeless individuals, whose often multiple health conditions are much more difficult to treat without stable housing. Many more people live in housing that is, in a very real sense, unaffordable, often to the detriment of their nutrition, needed medical care, and health.

- Nearly half of renters and 30% of homeowners in Massachusetts are "burdened" by housing costs — they spend more than 30% of their income on housing. The percentage has improved somewhat for homeowners since 2011 but has not changed significantly for renters. In spite of higher incomes in Massachusetts, the percentage of households that are housing cost-burdened is higher in Massachusetts than in the country as a whole.
- The number of homeless families using emergency assistance shelters and hotels declined in State Fiscal Year 2016, after several years of increases.
- Most homeless people in Massachusetts are in families, but chronically homeless individuals (i.e., not members of homeless families) have the most complex health needs.
- The number of children and youth who are homeless (including those in doubled-up housing situations) has increased steadily, through the 2014–2015 school year. The number of homeless children attending school in 2014–2015 was 49% higher than the number in 2009–2010.

1.4 Nutrition and Food Security

Access to and consumption of nutritious foods are important determinants of health. While Massachusetts fares better than the country as a whole, a sizable portion of the state's population experiences food insecurity. The level of food insecurity varies by region. There are also disparities in the consumption of healthy foods, across racial and ethnic groups, education levels, and gender. High school students eat fewer fruits and vegetables than middle school students, and more than half of all middle and high school students regularly drink sweetened beverages. There clearly is room for improvement in nutrition and food security, which would in turn improve population health.

- About three-quarters of a million people in Massachusetts were food-insecure in 2014. Suffolk (15.9%), Bristol (12.1%), and Hampden (11.7%) counties reported food insecurity rates higher than the statewide rate of 11.1%.

1.5 Access to and Affordability of Care

Access to care, as measured by health insurance coverage, is higher in Massachusetts than in any other state in the country. There are still access concerns, however. Certain groups — many of which have greater than average needs for health care — have lower rates of insurance coverage. And even those who are insured year-round do not have unfettered access because of barriers such as out-of-pocket costs and provider availability. Access also varies across geographic regions of the state.

- Over 95% of Massachusetts adults had health insurance at the time of a 2015 survey; about 85% said they had a usual source of health care other than an emergency room.
- Going without needed care was fairly common for adults with health insurance and in good or excellent health (35%), and even more common for adults who tend to need more care (54% of adults in fair or poor health).

Chapter 2. Health Risk Factors

2.1 Tobacco Use

While adult smoking rates continue to decline, use of tobacco continues to be a health behavior that puts a significant portion of Massachusetts residents at risk to adverse health outcomes. The increased use of electronic cigarettes among youth is exposing a new generation to nicotine addiction, and the public health impact of smoking and exposure to environmental smoke remains significant.

- Per capita tobacco sales are highly correlated with changes in the cigarette tax; when the tax is increased, people buy fewer packs of cigarettes.
- Cigarette smoking rates among high school students have fallen dramatically over the past decade (from 21% among high school students in 2005 to 8% in 2015), but electronic products have largely replaced cigarettes. When vaping is included (24% of high school students said they currently used electronic vapor products), it appears there hasn't been a reduction in nicotine use among high school students.

Chapter 3. Preventable Health Conditions

3.1 Asthma

Asthma is a common chronic disease among adults and children and imposes significant costs, both financial and in terms of health and well-being. There are disparities in the prevalence of asthma across racial and ethnic categories, income groups, gender, and cities and towns across Massachusetts. The most recent data from the Department of Public Health suggest that some disparities may be shrinking, but this one-year change may be an artifact of the survey sample. This bears watching over the next several years.

- Asthma prevalence among Massachusetts schoolchildren has grown over the five most recent school years for which data are available, from 80,440 (11.5%) in 2009–2010 to 85,355 (12.4%) in 2013–2014.
- Asthma prevalence among adults is higher in Massachusetts than in the median state; the Massachusetts rate peaked at 17.6% in 2014 before falling back in 2015.

3.2 Obesity

Obesity and overweight are important health conditions that often contribute to poor health outcomes in adults and children. Overweight and obesity rates vary across Massachusetts children, teens, and adults. Male middle school and high school students (especially Black and Hispanic students) were most likely to have a higher body mass index (BMI) compared to other students in 2015. Men and Black and Hispanic adults had higher rates of overweight and obesity compared to other adult groups. Low income people and adults with a disability are also more likely to be overweight or obese.

- Massachusetts' high school student obesity rate has remained relatively steady over the past 12 years, fluctuating between 10 and 11%. The state high school obesity rate was 2.9 percentage points lower than the national rate in 2015.
- Student perception about their weight does not reflect actual measurement and varies by grade. All students are more likely to think they are overweight than actually are. Over 30% of high school students think they are overweight, about double the actual rate.

3.3 HIV/AIDS

The trends in transmission and survival rates for people with HIV in Massachusetts have been very positive. The virus remains a risk for men who have sex with men, however, especially those who are Black non-Hispanic and Hispanic/Latino, and there is also an elevated risk for Black non-Hispanic women.

In the past, injection drug use was a leading risk for HIV infection and, while recent trends show that transmission from this risk behavior is falling, the opioid epidemic and increased rates of hepatitis C infections indicate that HIV may again become a major risk to people who are injecting drugs. It is worth noting that bleaching and cleaning needles if they are shared reduces but does not eliminate the risk of HIV infection (but this is not effective against hepatitis C).

- There are about 20,000 people in Massachusetts living with HIV/AIDS as of 2014, up from under 13,000 in 2000 — a testament to improved survival rates.
- New HIV diagnoses declined 47% from 2000 to 2014.
- White men represent 50% of men living with HIV/AIDS, but Black and Hispanic men are at higher risk; Black and Hispanic women are disproportionately living with HIV/AIDS.

3.4 Hepatitis C

Hepatitis C is a serious and chronic long-term disease that has broad health impacts in Massachusetts, and it affects vulnerable populations already at risk for HIV and opioid drug overdose. The escalating rates of hepatitis C among young people and in the southeast area highlight one of the risks of the ongoing opioid drug epidemic.

At the same time, hepatitis C is now curable with an expensive medication. We should expect that with the greater use of this medication, the incidence of hepatitis C should be greatly reduced, although education regarding safe use of needles and addressing the epidemic of drug use generally will be important.

- The rate of hepatitis C infection has been rising among 15- to 29-year-olds, and declining slightly among all other age groups. This is likely due to increasing transmission of the virus through injection drug use.
- Prevalence rates among young adults are strikingly high — much higher than the overall prevalence rates — on the Cape and Islands and in Bristol, Plymouth, and Franklin Counties.

3.5 Injury Resulting from Violence

Violence is an important public health concern. It affects health in direct and indirect ways. Though the Massachusetts' violent crime rate has been falling in recent years, it is still above the national rate and considerably higher than other New England states. Firearm death rates and murder rates in Massachusetts are relatively low, and rates of aggravated assault are relatively high. As with any social phenomenon, violent crime rates vary widely within the state, across cities and towns of all sizes.

Special attention is due to children, whose exposure to violence — as either victims or witnesses — can affect their lifelong well-being. Bully victimization is common, especially among middle school students, and other types of physical and sexual violence are also present, if less common.

- The rate of violent crime in Massachusetts in 2015 was 391 individuals per 100,000 population, down from 469 in 2010.
- One-third of Massachusetts middle school students and one-sixth of high school students reported having been bullied at school in the past year.

3.6 Substance Use — Opioids

The opioid epidemic is at a crisis level and shifts rapidly in Massachusetts. The rate of overdoses and deaths are affected by the types of opioids available on the street, with many drugs sold today having increased risk of overdose. Public health policies such as regulating prescribing of opiates, making medication-assisted treatment more available, providing prisoners on release with medication-assisted treatment and linking them to outpatient treatment on discharge, and making opiate reversal agents more available all play a role in combatting this epidemic. The trend data show how quickly death rates and substances used change.

- There has been a five-fold increase in opioid-related deaths in Massachusetts, from 355 in 2000 (5.6 individuals per 100,000 population) to 1,747 in 2015 (25.8 per 100,000).
- In 2013–2014, opioids accounted for more than one-quarter of all deaths of people 18 to 24 years of age, and more than one-third of deaths for people 25 to 34 years of age; in 2015, two-thirds of people who died from opioids were younger than 44.
- As the use of and deaths from opioid use have grown in recent years, the number of admissions to Bureau of Substance Abuse Services contracted and licensed programs has remained relatively flat (through 2014) with a small increase in admissions of 3,600 between 2011 and 2014.

3.7 Mental Illness

Massachusetts fares better than much of the country in terms of mental health and the prevalence of mental disorders and suicides. However, the numbers of people reporting depressive symptoms or being formally diagnosed with depression is high for both adults and youth. The incidence of suicide has been increasing over the last 10 years, and is now 1.8 times the rate of deaths from motor vehicles.

The increasing rates of adolescents reporting depressive symptoms and suicide ideation is concerning in Massachusetts and across the country. The impact of mental health disorders hits a large segment of the population, not just the 4% of the population who suffer from serious mental illness or who are served in the public mental health system.

Mental health disorders are linked to social determinants of health, especially income. While mental health disorders cause disability and distress on their own, mental health disorders are also linked with comorbid physical health disorders such as heart disease and diabetes, and affect the treatment and course of these comorbid medical conditions.

- Rates of major depressive episodes among adolescents are trending up in both Massachusetts and the United States, with 11% of Massachusetts adolescents reporting a major depressive episode in 2013–2014.
- Fifteen percent of Massachusetts high school students report having considered suicide, with 12% having made a plan and 7% having made an attempt in the prior year.
- Suicide rates in Massachusetts increased an average of 3.5% annually between 2003 and 2013. The overall increase in this time period was close to 32%.

3.8 Oral Disease

Oral health is an important — and often overlooked — part of general health. Oral diseases affect almost everyone: about 58% of teenagers and 97% of adults have had tooth decay during their life. Because oral diseases are often not treated, they have been called "a neglected epidemic" or "a silent epidemic." Oral diseases affect nutrition, digestion, speech, social mobility, employability, self-image, self-esteem, and a person's overall quality of life.

Severe disparities in oral health for high-risk population are extensive due to lack of access to prevention programs, dental treatment, and dental providers. Children, the elderly, the low income and less educated as well as racial, cultural, and linguistic minorities are at the highest risk. Other groups at high risk include MassHealth members and the uninsured; people who are homebound, homeless, institutionalized or medically compromised as well as the developmentally challenged; and people in certain geographic locations with shortages of dental professionals. Access to dental care is a serious problem for children on MassHealth. Access is also a serious concern for seniors, especially those in long-term care facilities.

Community water fluoridation (CWF) is the most cost effective prevention measure for better oral health, as everyone benefits, but in 2014 Massachusetts ranked 37th in the nation in providing fluoridated water to its communities and 62% of the state's population on a public water supply had access to fluoridated water, compared to 74.4% for the U.S. average during the same year. Most of the fluoridated communities in Massachusetts are in the eastern part of the state, with few fluoridated communities in western Massachusetts or Cape Cod. In addition, five larger communities — Barnstable, Brockton, Chicopee, Worcester, and Springfield with a total population of 529,602 — lack fluoridated water.

- In 2014, 25.3% of adults in Massachusetts had not seen a dentist in the past year, higher than the 2012 figure (23.8%).
- In 2014, 40.4% of adults with less than a high school education, 40.5% of those with incomes less than $25,000, and 32.2% of Black adults had not been to a dentist in the last year. In comparison, 23.6% of Whites who had not had a dental visit in the last year, 15.7% of those with a college education, and 14.0% of those making more than $75,000 a year.
- In FY 2015, only 1,695 MassHealth dentists were active providers (i.e., billed more than $10,000 a year); this was an 18% increase since FY 2013.
- 53.9% of MassHealth children had a dental visit in 2015, but only 16.8% received restorative treatment and basic dental care during their visit.
- About 2.7 million residents in 2014 did not have access to fluoridated water from their local water supply.

Introduction

This is the ninth edition of the Massachusetts Health Council's biennial report, *Common Health for the Commonwealth*. The report updates data and trends on preventable health conditions and social factors affecting the health of the people of Massachusetts. The report is organized into three chapters:

CHAPTER 1: SOCIAL DETERMINANTS OF HEALTH — broad social, economic, and environmental factors that have documented effects on people's health

CHAPTER 2: HEALTH RISK FACTORS — individual behaviors or personal characteristics that affect health

CHAPTER 3: PREVENTABLE HEALTH CONDITIONS — chronic conditions whose incidence may be reduced or managed through education, prevention, accessible, and affordable treatment, and other public health approaches.

Within each chapter, analyses of specific conditions, risk factors, and determinants have a similar structure. An overview defines the element and its relationship to individual and population health, citing evidence where available. Charts and tables displaying data are accompanied by bullet points that highlight important findings from the data. A summary ties up the analysis. One or more Policy Perspectives may highlight particular aspects of an issue and discuss approaches, existing or proposed, that could improve the health of the Commonwealth's residents.

All of the data used in the report are from publicly available sources. They are mostly state and federal agencies and also include private research and advocacy organizations. All sources are cited within the report.

Chapter 1

Social Determinants of Health

We have long understood from the research literature that social, environmental, and behavioral factors have a greater effect on health than either people's genes or the medical care they may or may not receive. This has been shown in studies on avoidable deaths and diseases such as heart disease, stroke, and diabetes.[1] The authors of a study on avoidable deaths, for example, noted that "[f]or the population as a whole, the most consistent predictor of the likelihood of death in any given year is level of education."[2] In addition to education, stability in housing and access to a nutritionally adequate diet are important influences on health. Also, economic circumstances such as family income affect health, both directly — members of poor families are less likely to be able to afford their share of health care costs and insurance premiums — and through interconnections with other social determinants (poverty is associated with housing instability and food insecurity).

This chapter examines measures of and trends in social determinants of health.

1.1 Income and Poverty

Overview

Poverty is a well-documented determinant of health and well-being.[3] People with poverty level incomes ($11,770 for an individual and $20,090 for a family of three in 2015) have higher rates of chronic disease such as diabetes and asthma than those with higher incomes.[4] Depression is also more common among those in poverty;[5] when depression afflicts a parent, it can also have long-term effects on her children.[6]

Many low income people no longer face one of the larger obstacles to health access and better health — lack of health insurance — since the coverage expansions of the Affordable Care Act took effect. But poverty and poor health are linked through many mechanisms other than health insurance. Diet is an important factor in chronic disease, but people in poverty are less likely to have easy access to healthy foods (this issue is addressed in the Nutrition section of this report). Likewise, getting exercise can be a challenge for people in poverty if they live in neighborhoods with higher crime rates, or if their time is scarce because of family and work responsibilities.

Poverty especially affects the children's health. Children in poor families are at greater risk of inadequate nutrition, behavioral problems, physical health problems, and developmental delays. Poverty adversely affects young children's brain development, which in turn can result in lower educational attainment. These effects can last into adulthood, making it more likely that someone will remain in poverty, passing that economic status and its attendant health effects, to the next generation.[7]

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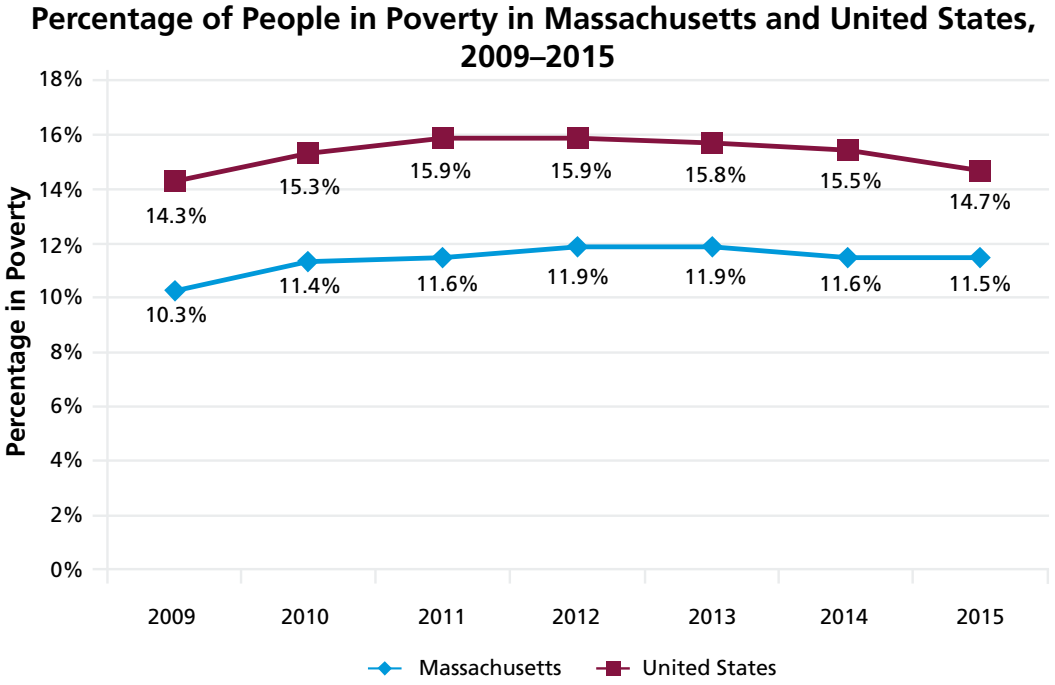
[1]Taylor LA et al. *Leveraging the social determinants of health: What works?* Blue Cross Blue Shield of Massachusetts Foundation. June 2015.
[2]McGinnis JM, Williams-Russo P, and Knickman JR. The care for more active policy attention to health promotion. *Health Affairs*. 2002; 21(2).
[3]Simon D. *Poverty fact sheet: Poor and in poor health*. Institute for Research on Poverty. University of Wisconsin–Madison.
[4]Centers for Disease Control and Prevention. CDC health disparities and inequalities report — United States, 2013. *MMWR*. 2013;62(Suppl 3).
[5]Brown A. With poverty comes depression, more than other illnesses. www.gallup.com/poll/158417/poverty-comes-depression-illness.aspx. Accessed October 18, 2016.
[6]Vericker T, Macomber J, and Golden O. *Infants of depressed mothers living in poverty: Opportunities to identify and serve*. The Urban Institute. August 2010.
[7]Hair NL, Hanson JL, Wolfe BL, et al. Association of child poverty, brain development, and academic achievement. *JAMA Pediatr*. 2015;169(9):822–829.

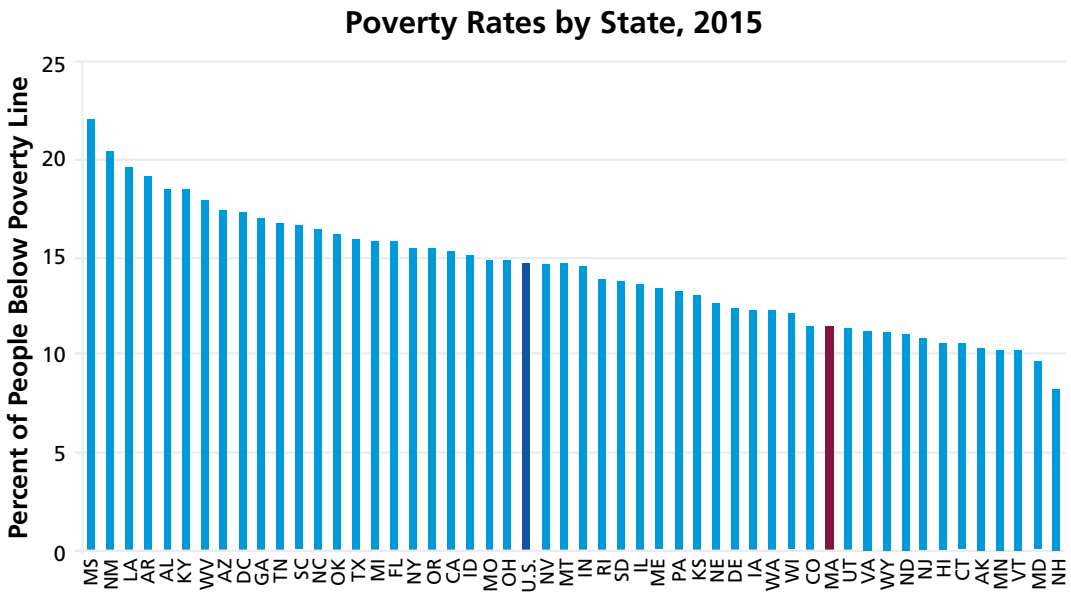
Children are, in fact, more likely than adults to be poor. Nationally, more than one in five children (20.7%) was poor in 2015, compared with 13.9% of adults under age 65. In Massachusetts, 14.8% of children lived below the poverty line in 2015, compared with 10.9% of adults.

Trends



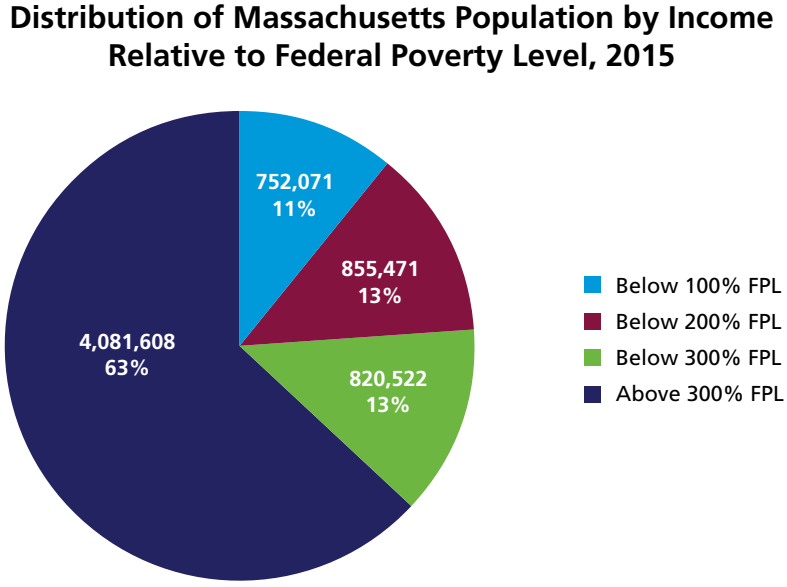
Source: U.S. Census Bureau, *American Community Survey*, multiple years.

- In 2015, 11.5% of Massachusetts residents were poor.
- The poverty rate in Massachusetts is about three percentage points lower than the nation as a whole, but the Massachusetts rate still represents over 750,000 people living below the poverty line — about $11,000 for an individual and $20,000 for a family of three in 2015.
- While poverty rates have stabilized and even declined slightly in recent years, a greater percentage of the population was poor in 2015 than in 2009, before the full effects of the Great Recession were felt. This is also the case in the United States overall, despite the dramatic drop in the poverty rate from 2014 to 2015.



Source: U.S. Census Bureau, *American Community Survey*, 2015.

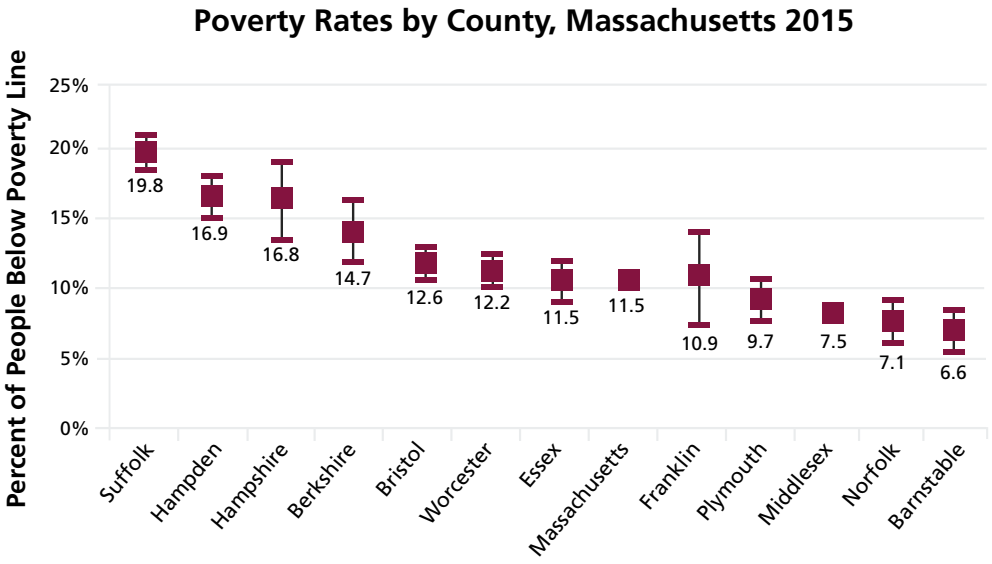
- Massachusetts has a low poverty rate compared with most other states.
- All New England states have poverty rates below the national average; Massachusetts has the fourth-lowest estimated poverty rate among New England states (after New Hampshire, Vermont, and Connecticut).



Source: U.S. Census Bureau, *American Community Survey,* 2015.

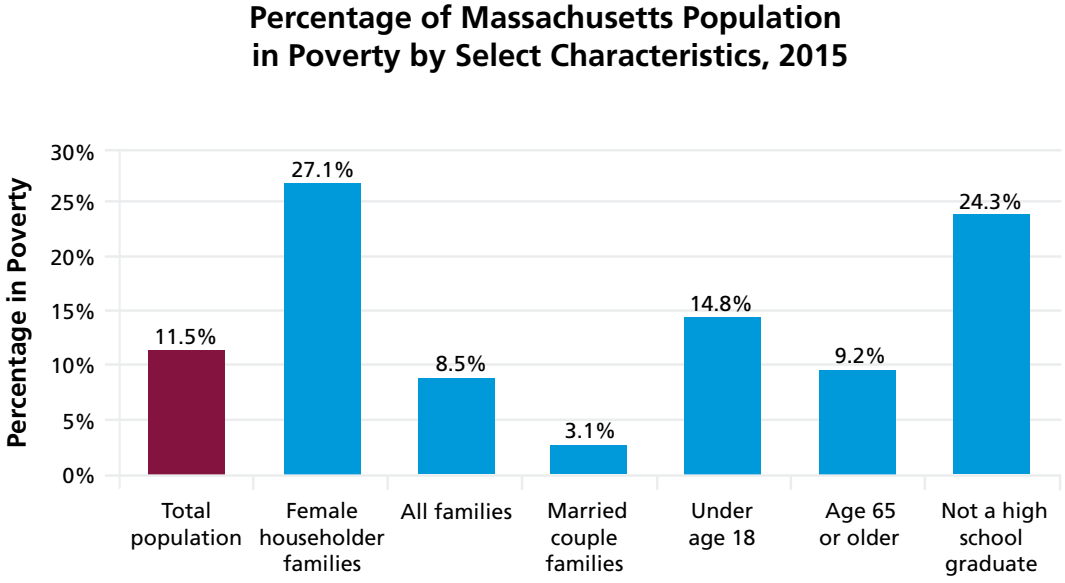
- Though the federal poverty level (FPL) is a standardized benchmark of financial well-being, it does not necessarily represent the threshold for a living wage. Some research indicates that a family requires an income of two to three times the poverty level to meet its basic needs (*Source:* MIT Living Wage Calculator, http://livingwage.mit.edu). In Massachusetts, one-quarter of the population had income below 200% of FPL in 2015, and nearly 40% had income below 300% of FPL.

- Incomes in Massachusetts have been growing at a modest pace: median household income in Massachusetts increased 8.1% (inflation-adjusted) from 2012 to 2015.



Ranges represent the sample margin of error.
Source: U.S. Census Bureau, *American Community Survey*, 2015.

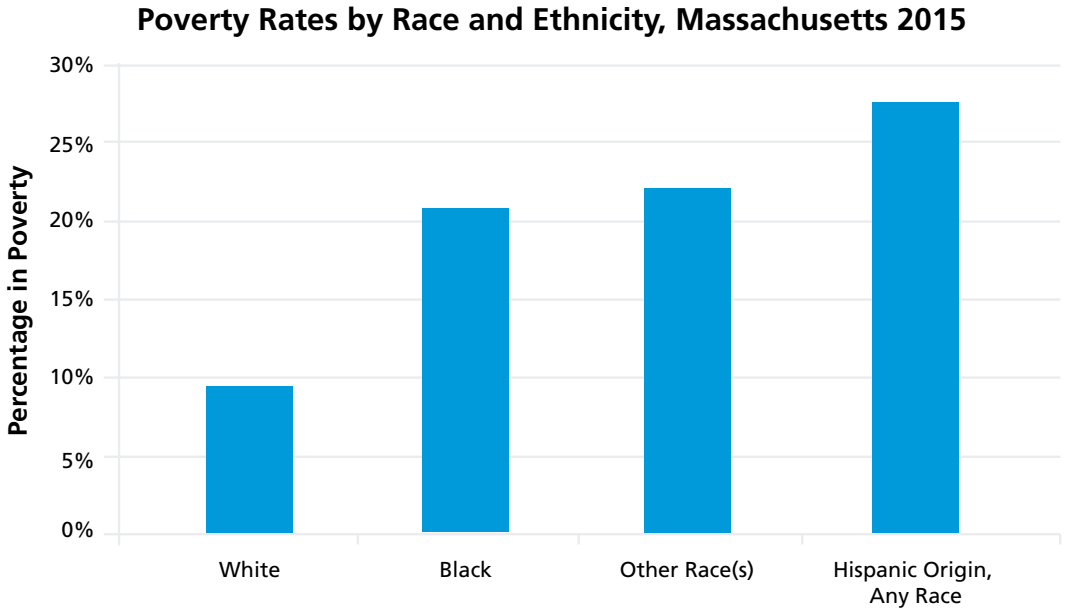
- Poverty is not evenly distributed across Massachusetts. Poverty rate estimates range from 6.6% in Barnstable County on Cape Cod to 19.8% in Suffolk County, which includes Boston. Within counties, cities and towns experience a range of poverty rates as well.



Source: U.S. Census Bureau, *American Community Survey*, 2015.

Poverty is more likely to affect young people, those in certain family structures or with low levels of education, and members of racial and ethnic minorities.

- Children are disproportionately poor, with a poverty rate of 14.8%.
- More than one-quarter of people who live in households headed by a woman with no spouse present are poor. In contrast, married couple families (which often include at least two wage earners) have a very low poverty rate.
- Adults without a high school diploma also have a poverty rate that is more than double the overall state rate.



Source: U.S. Census Bureau, *American Community Survey*, 2015.

- Members of racial minorities and Latinxs have poverty rates that are higher than the overall state rate.
- Black residents are more than twice as likely as White residents to be poor.
- The poverty rate for Latinxs is three times the rate for White residents.

Summary

Poverty puts people's health at risk. Though Massachusetts has a lower poverty rate than the nation as a whole, three-quarters of a million people in the Commonwealth live below the poverty line, and more than 1.6 million have income below twice the poverty line, which is still a low enough income to affect health. Members of certain groups are at a higher risk of living in poverty, and therefore of poverty-related health deficits. These groups include children — especially those in single female-headed families — people with lower educational attainment, racial minorities, and Latinxs. Many of these groups also are disproportionately affected by some of the other social determinants and risk factors discussed elsewhere in this report.

Policy Perspective

Income and wealth are determined in large part by birthright and not by individual choice. Therefore, we must invest in low-income communities and promote economic and social policies that improve opportunity for mobility. We must also call out racial injustices that have caused African American and Latinx residents to suffer the worst health outcomes, even taking social class into account.

In 2016, the Massachusetts legislature authorized $6,000,000 for the Massachusetts Food Trust program. This funding must now be released. If funded, the program would bring grocery stores to low-income communities and communities of color, providing better access to healthy food and serving as an economic driver by creating jobs. Another important initiative, the Complete Streets Certification Program, was passed into law two years ago and provides funding for low-income communities to invest in infrastructure to make physical activity easier. Transportation has a direct impact on health and wealth. Investing in transportation will allow low income residents to have better access to good jobs, get to doctor's appointments, and improve connectedness to community resources. The Massachusetts Public Health Association supports passing the Fair Share constitutional amendment in 2018. Revenue from this constitutional amendment would go to fund repairs of roads, bridges, and our crumbling transportation infrastructure, in addition to education programs.

We must improve the economic circumstances of those born into and experiencing poverty. We can do this by increasing the minimum wage to $15 an hour, enacting paid family and medical leave, and improving and investing in early education and care programs. When Minnesota passed a minimum wage increase in 2014, the state's health director declared it was the most important public health achievement in that state. He noted that even the tobacco tax increase the year before was not as powerful as the minimum wage increase for improving health.

In Massachusetts, we have one of the most unequal distributions of wealth in the entire country. It is no surprise that the poor are suffering from diseases that could be prevented. If we ever hope to turn this around and improve the health of our state's residents while reducing costs, we must take action to level the playing field.

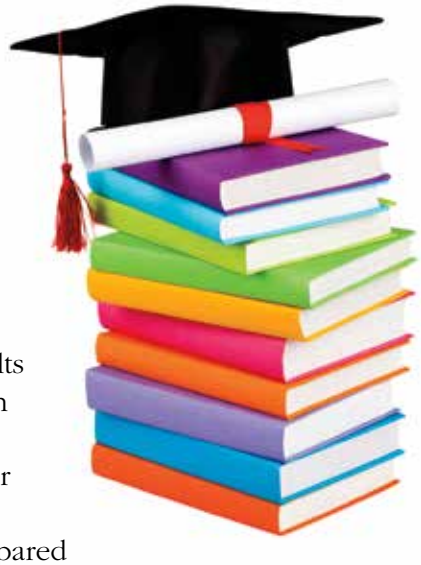
Rebekah Gewirtz
Executive Director
Massachusetts Public Health Association

SOURCE

U.S. Census Bureau, *American Community Survey (ACS)*. www.census.gov/acs/www/data/data-tables-and-tools/american-factfinder. Accessed via American Fact Finder. 2015 data in this report use the ACS one-year data profile.

1.2 Education

Overview



Education is an important predictor of and contributor to good health outcomes. Like poverty, a low education level often correlates to poor health literacy, poorer health outcomes, and shorter life expectancies. With better education, individuals and families can improve other social factors that often contribute to overall health, such as salaries and employment that provides access to health care services. Better educated people also tend to live in healthier homes and neighborhoods. A federal study found that "[a]t age 25, U.S. adults without a high school diploma can expect to die 9 years sooner than college graduates."[8] In Massachusetts, as in other states, people with lower educational attainment are more likely to suffer from particular conditions. Those with less than a high school education were most likely to be obese, have diabetes, and have heart disease when compared to Massachusetts residents with higher levels of educational attainment. With education (especially health education), children and adults can live healthier lives.

In 2015, Massachusetts reported high student enrollment and graduation rates. Over the past decade, annual high school dropout rates have decreased, while the cohort graduation rate has increased over the same time period.[9] When measured across the adult population, Massachusetts adults age 25 and over had high educational attainment rates in 2014; on average, 89.5% of adults had a high school degree or equivalent, and 40% of adults had a bachelor's degree or higher. The state had a higher annual graduation rate (86.1%) and lower annual high school dropout rate (2%) compared to the national average (82.3% and 6.5%, respectively) for the 2013–2014 school year. Massachusetts had low annual *and* cohort dropout rates[10] during the 2014–2015 school year (1.9% and 5.1%, respectively), though those numbers varied by gender, race, and other student characteristics. Male and Latinx students were most likely to drop out of high school during the 2014–2015 school year. Conversely, female, White and Asian students had the highest graduation rates. Low-income, high-need,[11] English-language learners and students with disabilities also had varied high school graduation rates during 2014–2015; generally, English-language learners and students with disabilities were less likely to graduate from high school in comparison to other student subgroups. The data suggest that additional supports for at-risk students and those in other groups are needed in order to improve educational and health outcomes.

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[8]Agency for Healthcare Research and Quality. *Population health: Behavioral and social science insights — understanding the relationship between education and health*. www.ahrq.gov/professionals/education/curriculum-tools/population-health/zimmerman.html. Accessed on October 1, 2016.

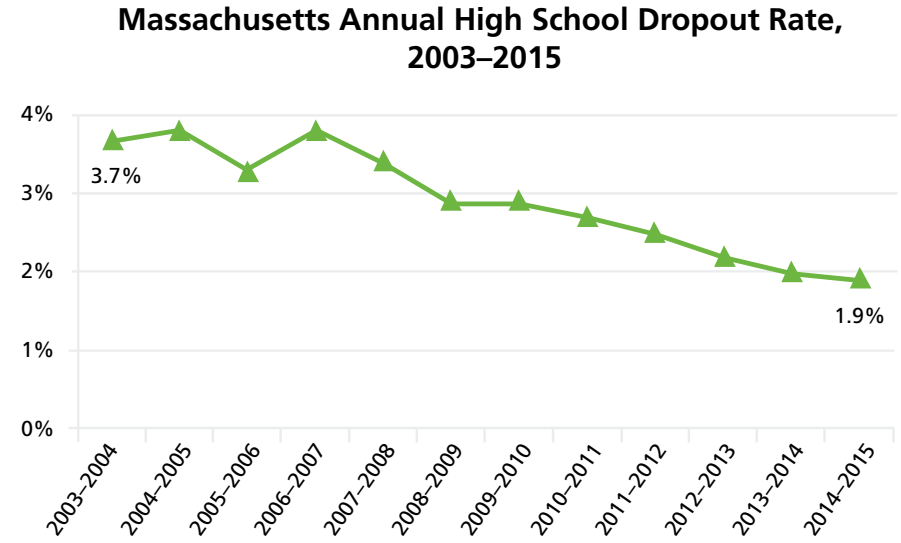
[9]The annual graduation rate refers students in grades 9 through 12 who have graduated during a given school year. The cohort graduation rate refers to the percentage of students who start ninth grade in a given year and graduate in the expected time.

[10]The annual *dropout* rate refers to the number of students in grades 9 through 12 who have stopped going to high school during a given school year. The cohort dropout rate refers to the number of students starting the ninth grade who had dropped out of school at the end of their expected high school graduation year.

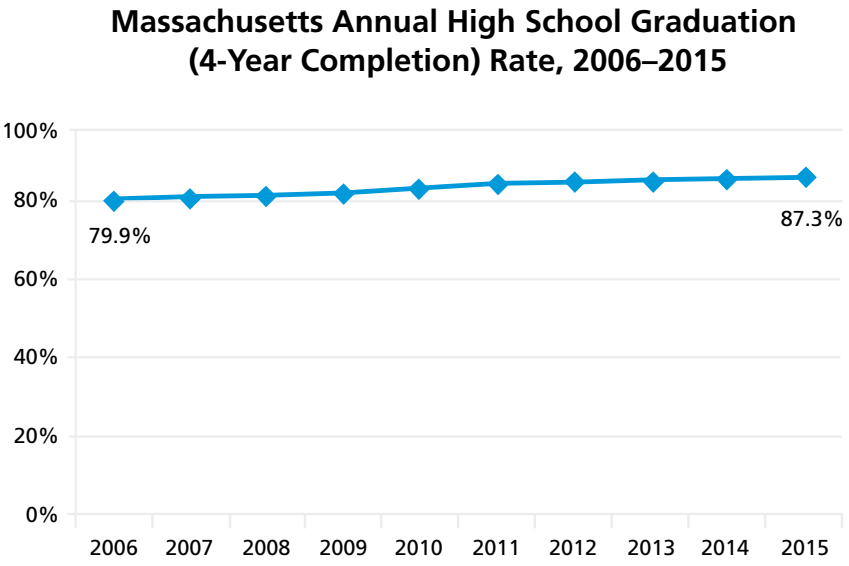
[11]According to the Massachusetts Department of Education (DOE), a "high need" student is an individual "designated as either low income (prior to School Year 2015), economically disadvantaged (starting in School Year 2015), or ELL, or former ELL, or a student with disabilities. A former ELL student is a student not currently an ELL, but had been at some point in the two previous academic years." More information about DOE's demographic definitions can be found at http://profiles.doe.mass.edu/help/data.aspx?section=students.

Trends

Overall Massachusetts Education Trends



Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

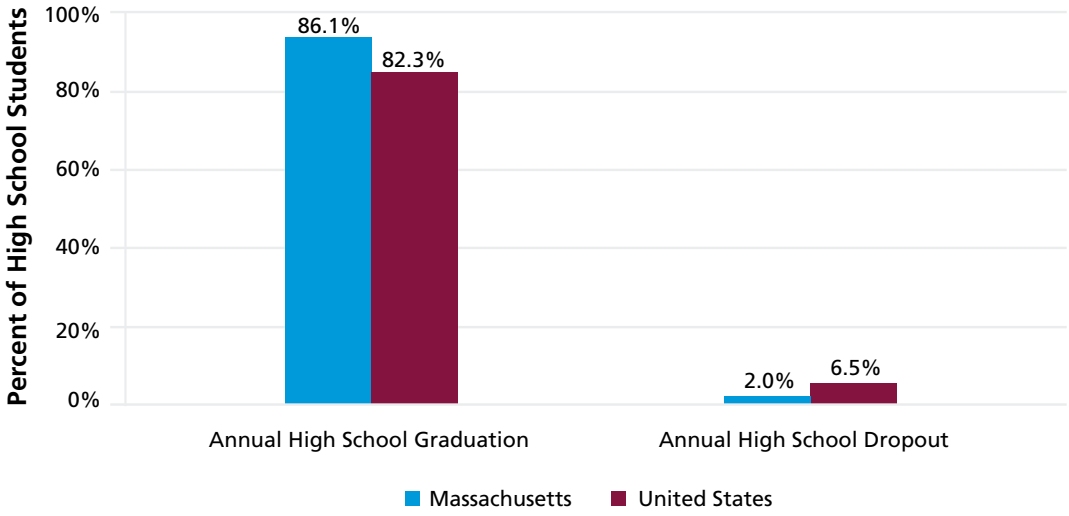


Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

- Overall, 1.9% of all students in Massachusetts dropped out of school during the 2014–2015 school year. During the same school year, 5.1% of all students in their respective cohort dropped out of school. In the same time frame, 87.3% of all students in their respective cohort graduated from high school in four years.

- The 2014–2015 school year annual graduation and dropout rates reflect an ongoing trend in Massachusetts educational attainment. Since the 2003–2004 school year, annual high school dropout rates declined by 1.8 percentage points, and annual high school graduation rates increased by 8.3 percentage points.

Annual High School Graduation and Dropout Rates, United States and Massachusetts, 2013–2014 School Year

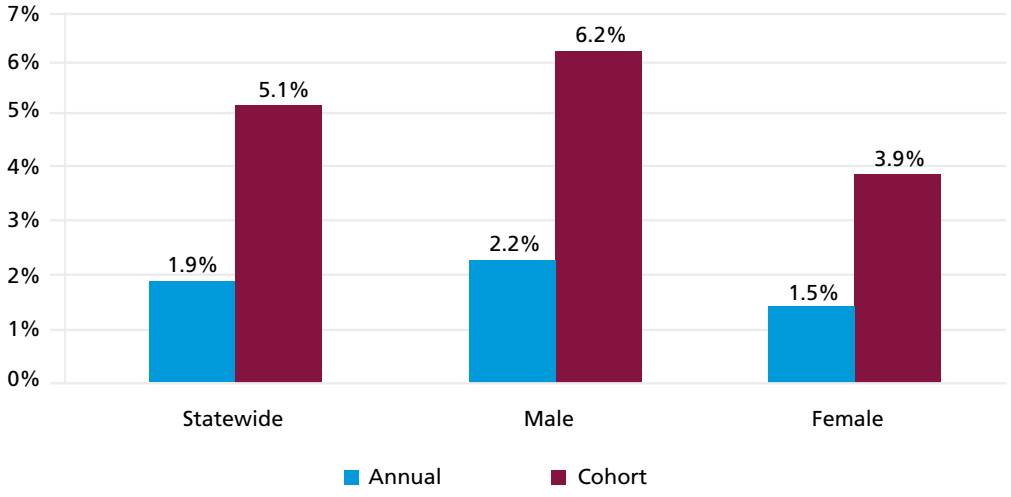


Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

- The state had a higher annual graduation rate (86.1%) and lower annual high school dropout rate (2%) compared to the national average for the 2013–2014 school year (82.3% and 6.5%, respectively).

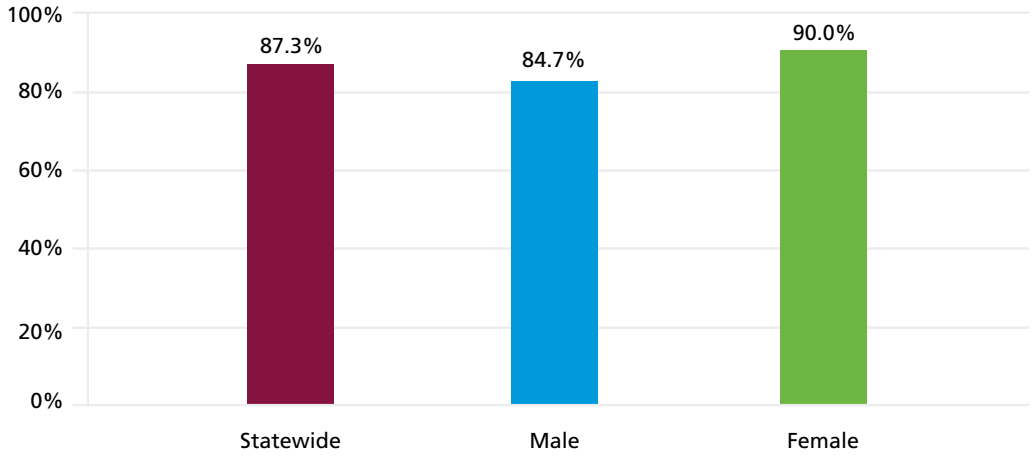
Demographics Trends

Dropout Rates by Gender, 2014–2015 School Year



Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

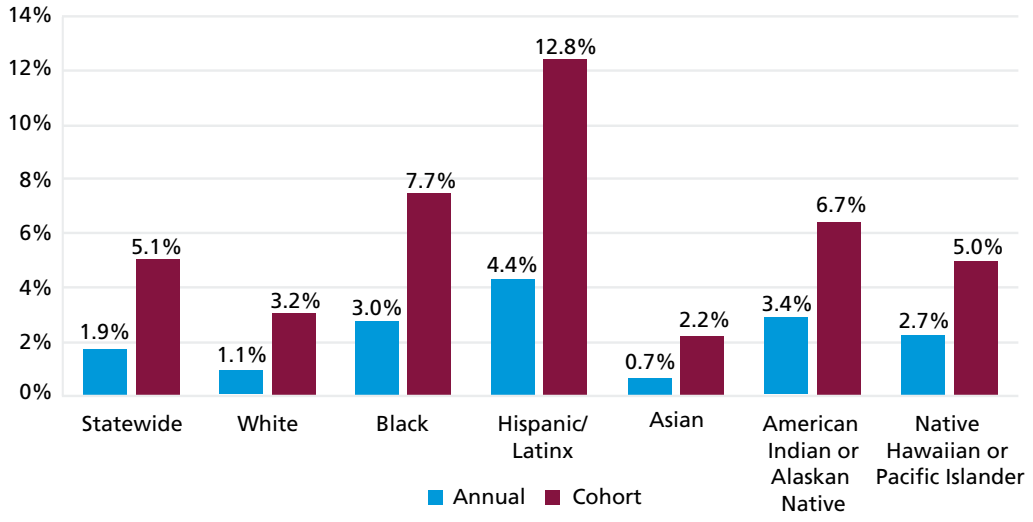
High School Graduation Rate by Gender, 2014–2015 School Year



Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

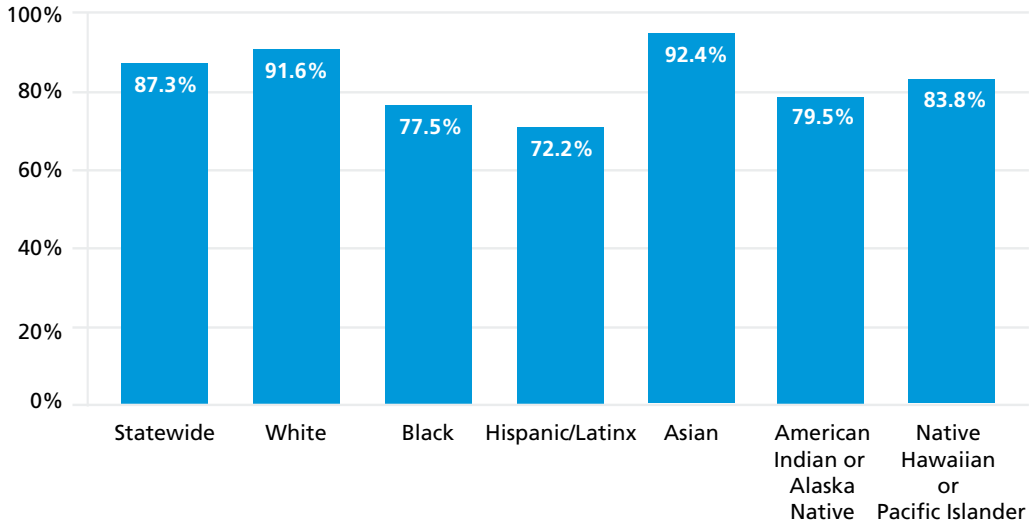
- Male students in Massachusetts had lower education completion rates in comparison to their female counterparts: 2.2% of male students annually dropped out of school, and 6.2% of the total male cohort dropped out of school during the 2014–2015 school year. Similarly, 84.7% of male students graduated from high school, compared to 90% of the state's female students.

Massachusetts Annual and Cohort Dropout Rates by Race/Ethnicity, 2014–2015



Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

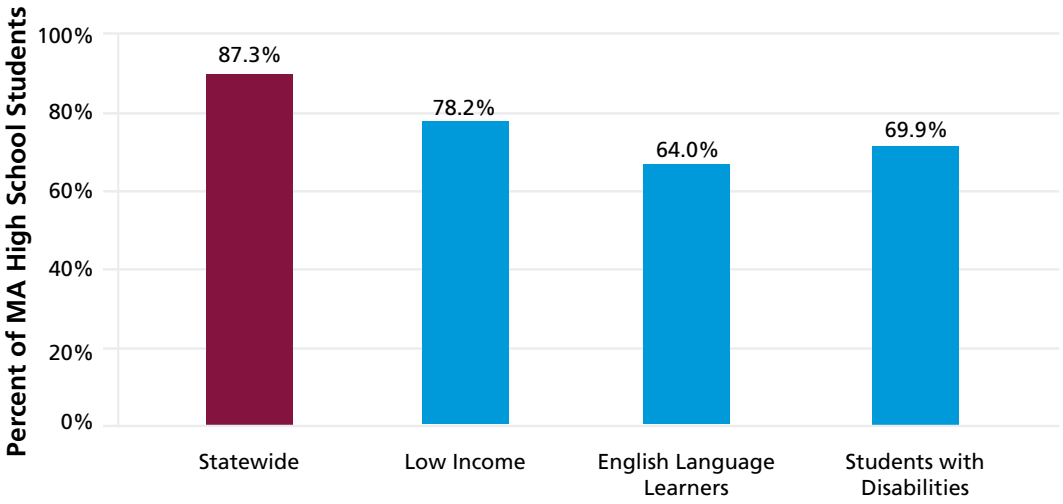
Massachusetts High School Graduation Rates by Race/Ethnicity, 2014–2015 School Year



Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools*.

- Hispanic/Latinx, Black, and American Indian/Alaskan Native students had the highest annual and cohort dropout rates among racial and ethnic groups in the 2014–2015 school year.
- Asian and White students had the highest graduation rates during the 2014–2015 school year. Black and Hispanic/Latinx students had the lowest graduation rates.

Massachusetts High School Graduation Rates for High Need Students, 2014–2015 School Year

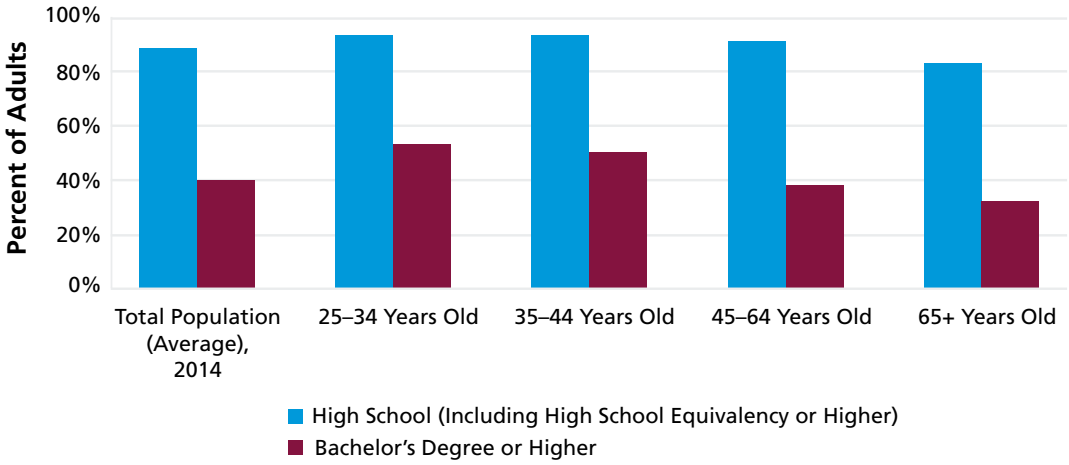


Source: Massachusetts Department of Elementary and Secondary Education, *High School Dropouts 2014–2015, Massachusetts Public Schools.*

- Students classified as "high need" by the State — low income, English-language learners, and students with disabilities — all had lower graduation rates than the overall statewide rate, with English-language learners the lowest.

- These categories also often face inequities in the health care system, which lower levels of educational attainment only exacerbate.

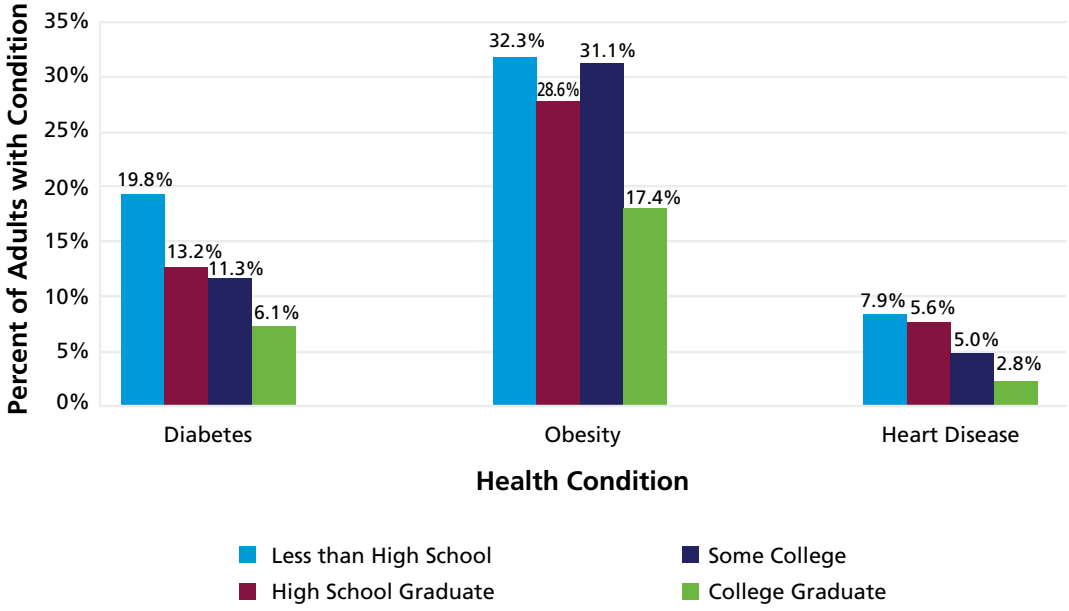
Educational Attainment of Massachusetts Adults by Age



Source: U.S. Census Bureau, *2010–2014 American Community Survey 5-Year Estimates*.

- Nine in 10 Massachusetts adults have a high school diploma, and four in 10 have a bachelor's degree or higher.
- High school diplomas are similarly common for all age groups of adults under 65, but younger adults are more likely to have college degrees.
- Adults 65 and older are less likely both to have a high school diploma and to have a post-high-school degree.

Prevalence of Health Conditions Among Massachusetts Adults by Education Level, 2015



Source: United Health Foundation, *America's Health Rankings: 2015 Annual Report, Massachusetts*.

- Certain chronic diseases are strongly correlated with educational attainment (and with other social determinants such as income and diet). Adults without a high school diploma are more than three times as likely as college graduates to have diabetes, and nearly three times as likely to have heart disease.
- The disparity in obesity occurrence appears to occur between those with and without a college degree.

Summary

Educational attainment in Massachusetts varies significantly by gender, race, and other important characteristics. Educational attainment is lower for groups that also disproportionately experience other social determinants of health, amplifying health disparities. Low educational attainment affects health status the prevalence of specific diseases and conditions, and mortality rates. Raising education levels, particularly among at-risk groups, could improve population health.

Policy Perspective

Massachusetts residents who don't graduate from high school suffer from lower income, decreased wealth, more family instability, and greater likelihood of incarceration, as do their peers nationwide. As a result, they suffer from poorer overall health prospects. While state graduation rates have improved in recent years, we could improve them further by following the recent nationwide trend to eliminate high school graduation exams.

Research clearly links less schooling to higher levels of risky behaviors. These include smoking, being overweight, or having a low level of physical activity. Those who lack high school diplomas have a reduced life expectancy of three to five years. According to the Population Reference Bureau, a 25-year-old high school dropout's life expectancy is 10 years less than a college graduate of the same age.

Students fail to graduate from high school for many reasons. However, one significant contributor is high school graduation tests. Education researchers have consistently linked such exams to depressed graduation rates and higher dropout rates, as well as increased rates of incarceration. For example, a 2011 National Academy of Sciences review of 10 years of research found exit exams depress graduation rates without improving overall educational quality, nor do they enhance college or workplace success.

Massachusetts math and reading scores on the National Assessment of Educational Progress (NAEP) are among the top two in the nation, but our graduation rate is not among the top 10. This is despite the fact that graduation rates, like test scores, reflect wealth — and Massachusetts is among the richest states. The MCAS high school graduation test requirement is a major reason for the state's relatively lower graduation rate. Some observers have attributed our students' top scores on the NAEP to our exit exam, but our students were among the top performers on that measure since long before the introduction of the high-stakes graduation tests.

There is a national trend to eliminate graduation tests. Fourteen states have dropped these exams in the past several years. Some have retroactively awarded diplomas to students who had been denied them based on their test scores, despite completing all other graduation requirements. Nine of the 11 states with the highest graduation rates do not require students to pass a graduation test, nor does any other New England state. In fact, Massachusetts state law does not

mandate a graduation test; that is a policy set by the Board of Elementary and Secondary Education. The Commonwealth could prevent social costs in the billions of dollars, all at no cost to educational quality, by eliminating high school exit exams.

Lisa Guisbond
Policy Analyst, FairTest
Executive Director, Citizens for Public Schools

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Massachusetts Department of Elementary and Secondary Education. *High school dropouts 2014–2015 Massachusetts public schools*. www.doe.mass.edu/infoservices/reports/dropout/2014-2015/summary.pdf. Published 2015. Accessed November 22, 2016.

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Zimmerman E, Woolf S. *Understanding the relationship between education and health: A review of the evidence and an examination of community perspectives. Population Health: Behavioral and Social Science Insights*. September 2015. www.ahrq.gov/professionals/education/curriculum-tools/population-health/zimmerman.html. Accessed November 22, 2016.

1.3 Housing and Homelessness

Overview

Secure housing, or the lack of it, is an important social determinant of health. Extensive evidence links stable housing with health outcomes. Direct health effects of unstable, unaffordable housing or homelessness include many related to stress. Living in a more crowded setting — a shelter, for example, or a doubled-up housing situation — causes stress and may provide more exposure to infectious diseases. Conversely, secure housing in a safe neighborhood reduces stress and leads to better health.

Homeless children are more likely than children in stable housing situations to have lower weight for their age and to experience developmental delays and mental health problems, including depression. Adults also are more likely to have mental health problems if they do not have stable housing. People with chronic illnesses such as HIV/AIDS, diabetes, and hypertension can maintain their treatment regimens more easily when they are in stable housing.[12]

Housing circumstances also are closely tied to other social factors that affect health. Nearly half of Massachusetts households who rent their homes and almost 30% of those who own them are in "cost-burdened" housing situations, according to a Housing and Urban Development (HUD) definition that sets the threshold for cost burden at 30% of household income.[13] Families struggling to pay their housing costs have less to spend on food; the effects of food insecurity on health are discussed elsewhere in this report. Low-income families, of course, face special challenges. Adults in unaffordable housing, for example, are more likely to be in fair or poor health and forgo needed medical treatment or prescriptions because of the cost.[14]

[12]Maqbool N, Viveiros J, Ault M. The impacts of affordable housing on health: A research summary. Center for Housing Policy. April 2015.
[13]U.S. Department of Housing and Urban Development. Affordable housing. http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing. Accessed September 30, 2016.
[14]Maqbool et al.

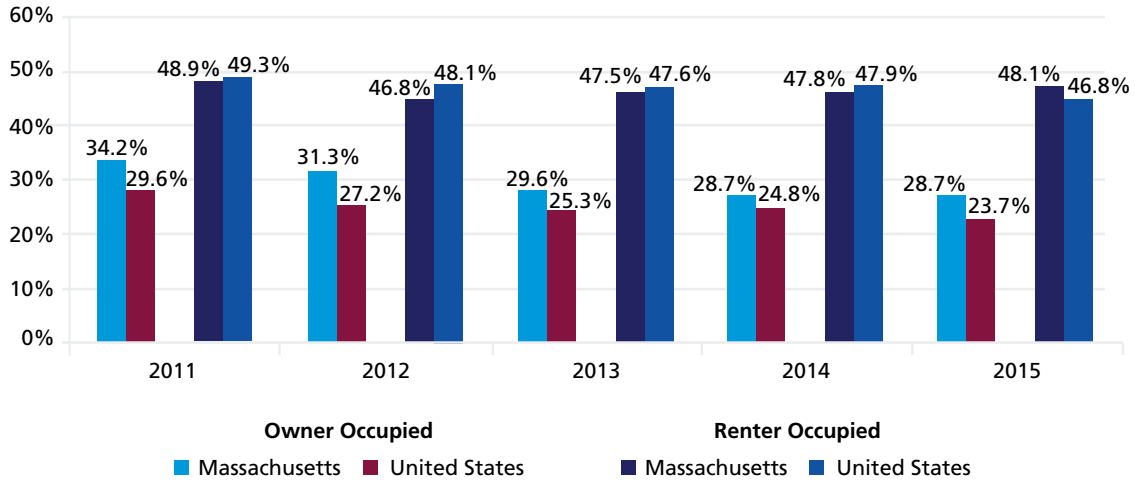
Environmental hazards associated with substandard housing, often the only type of housing that low-income families can afford, also affect health. Low-income families are more likely to live in homes with lead-based paint. The air quality in substandard homes can trigger asthma symptoms, and poorly maintained housing contains other allergens such as mold, dust mites, and rodents.

The health experience of homeless families in Massachusetts is consistent with national findings. Boston Health Care for the Homeless, in a 2013 analysis of MassHealth costs and utilization, found that homeless members had higher rates of mental and physical health needs, and also greater health care costs. When compared to other MassHealth members, homeless patients cost 3.8 times more.[15]

Public policy in Massachusetts recognizes the far-reaching impact of housing instability and homelessness. The Interagency Council on Housing and Homelessness recently launched new initiatives in service to its mission to prevent and end homelessness. MassHealth, in direct recognition of the special health care needs of homeless people, is expanding a service called Community Supports to People Experiencing Chronic Homelessness (CSPECH). Other public and private housing agencies provide services that address the mental and physical health challenges of individuals and families in inadequate housing or with no home at all.

Trends

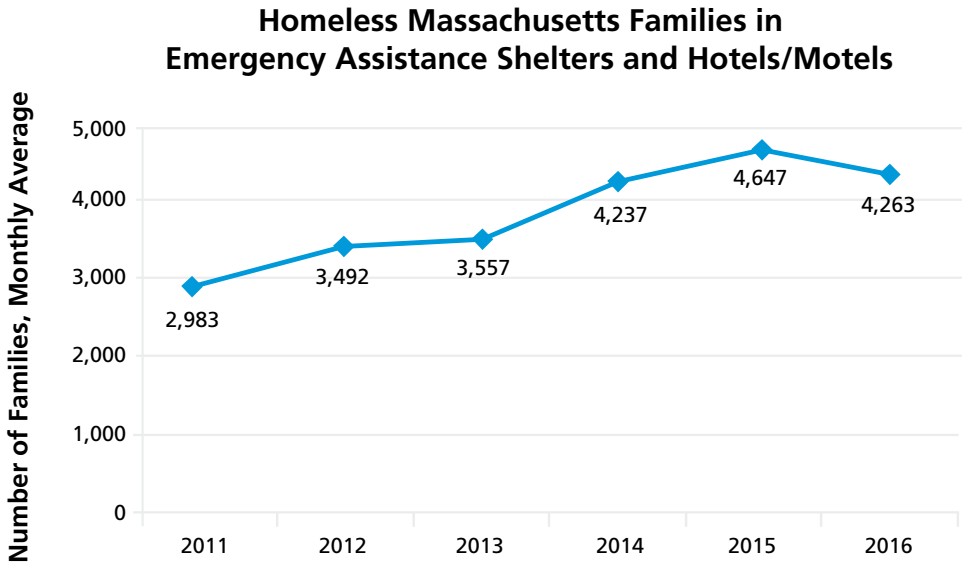
Percentage of Households in Which Housing Costs are 30% or More of Income



Source: U.S. Census Bureau, *American Community Survey*, multiple years.

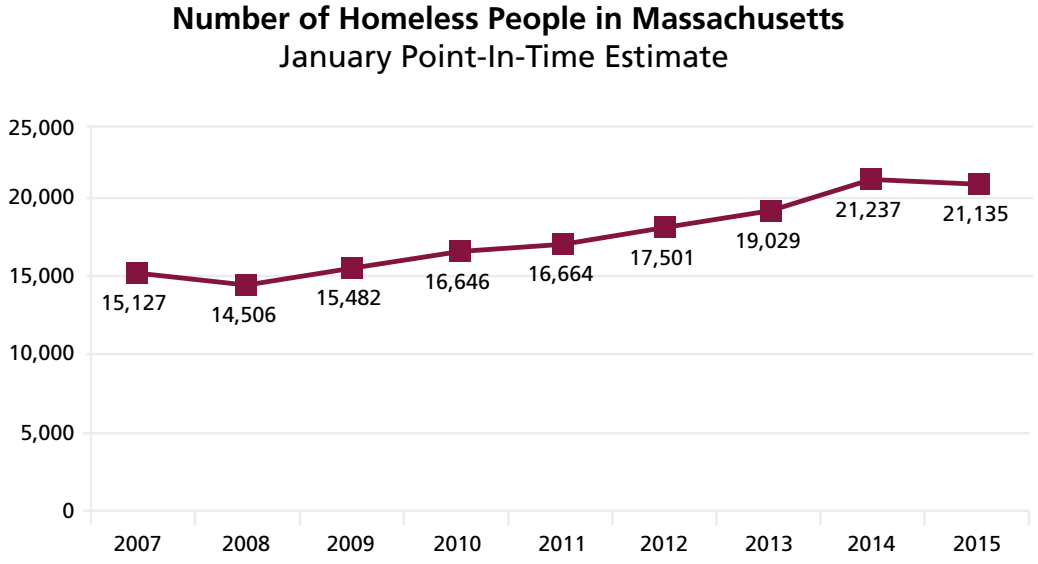
- Just under 3 in 10 Massachusetts households who own their homes are cost burdened — that is, they spend more than 30% of their income on housing. This is a 16% improvement from 2011, when over a third of owner-occupant households were cost-burdened; renters have not seen a significant improvement in this statistic.
- Nearly half of renters in Massachusetts and across the country are considered "burdened" by housing costs.

[15]Bharel Monica et al. *Health care utilization patterns of homeless individuals in Boston: Preparing for Medicaid expansion under the Affordable Care Act*. www.ncbi.nlm.nih.gov/pmc/articles/PMC3969142. Accessed September 8, 2016.



Source: Massachusetts of Housing and Community Development, *Number of Families in EA Shelters and Hotels/Motels*.

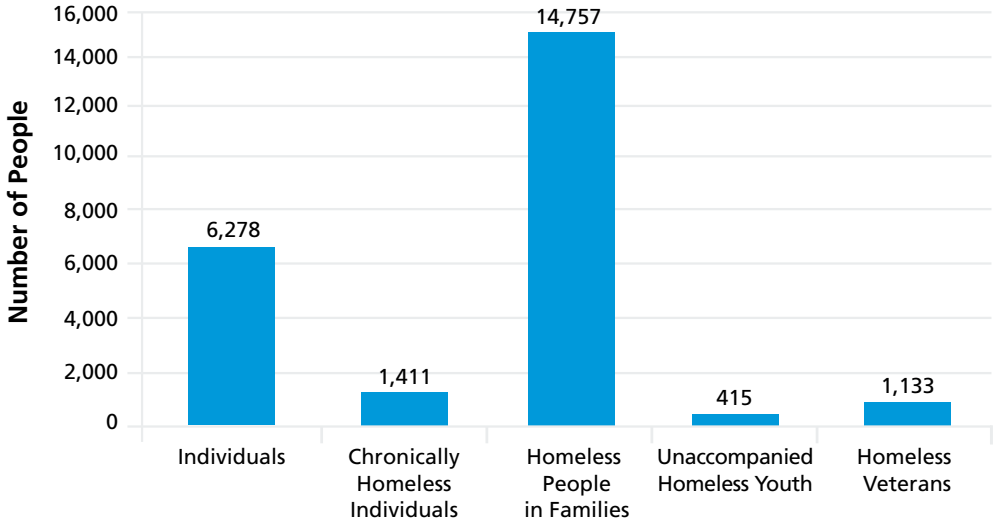
- The average number of homeless families living in Emergency Assistance housing (either a hotel or designated shelter) has increased over the past five years, peaking in 2015. In that year, an average of 4,600 families per month were living in emergency housing.
- The 2016 figure (based on the first 10 months of the state fiscal year) indicates that the monthly count of homeless families is falling; in April 2016 it was 3,861.



Source: U.S. Dept. of Housing and Urban Development, Point-in-Time Estimates for January of each year.

- Overall, homelessness in Massachusetts steadily increased through 2014 and held steady in 2015. The 2015 number is 46% higher than the low point of this series in 2008 and represents 0.3% of the state population.

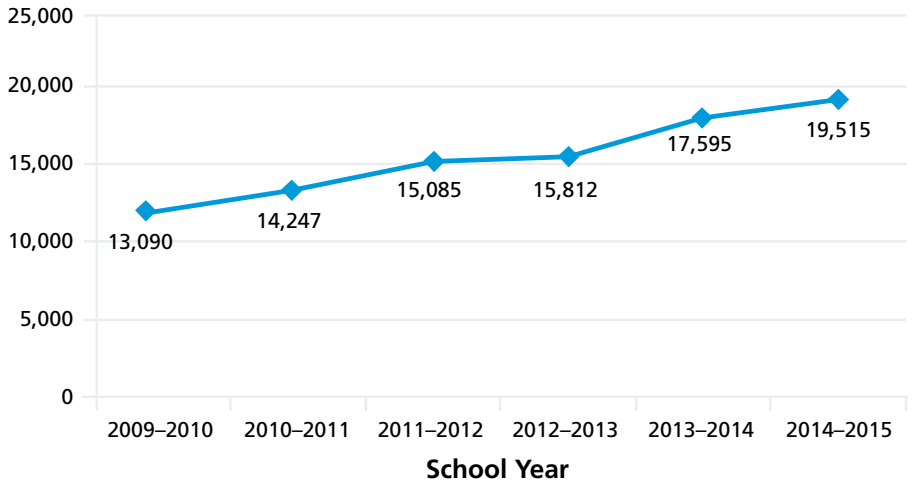
Homeless People in Massachusetts, 2015



Source: U.S. Dept. of Housing and Urban Development, *Annual Homeless Assessment Report (AHAR)*, 2015.

- Most homeless people in Massachusetts are in families, and most family members are children.
- The number of chronically homeless individuals (1,411) is relatively small, but chronically homeless people tend to have very complex health problems and health care needs.
- The number of children and youth who are homeless and attending school in Massachusetts has also increased over time. The number in the 2014–2015 school year was 49% higher than in 2009–2010. (Department of Elementary and Secondary Education [DESE] homeless student statistics include students in doubled-up housing, which HUD data do not. There were 5,540 such students in 2009–10 and 7,602 in 2014–2015.)

Massachusetts Students in Primary and Secondary Education Who Are Homeless During School Year



Source: Massachusetts Department of Elementary and Secondary Education, *McKinney-Vento Summary*.

Summary

Unstable housing and homelessness have direct health effects and indirect effects through other social determinants of health. While the number of homeless people in Massachusetts is relatively small, many of them are children — whose developmental, mental, and physical health are susceptible to stressful housing situations — and chronically homeless individuals, whose often multiple health conditions are much more difficult to treat without stable housing. Many more people live in housing that is, in a very real sense, unaffordable, often to the detriment of their nutrition, needed medical care, and health.

Policy Perspective

This is a pivotal moment in both housing and health care policy in Massachusetts. On the housing front, innovative financing models of supportive housing for chronically homeless individuals have blossomed in the past decade, including MassHealth's Community Support Program for People Experiencing Chronic Homelessness program, a reimbursement mechanism for the supportive services sometimes necessary to help a disabled person maintain a tenancy, as well as one of the country's first social innovation financing programs that combines government and private funds to scale up Housing First programs across the state.

Homeless *continuums* of care across the state, which receive funding from Housing and Urban Development, are increasingly focused on ending homelessness by shifting resources to permanent housing and more effectively matching available housing opportunities to homeless people who may qualify for those units. Governor Baker's administration has increased short-term rental assistance programs aimed at more effectively helping homeless families with a path out of homelessness. Despite all this progress in housing policy, a major stumbling block in urban areas across the state is the small portfolio of housing stock available to homeless and very low-income people — this remains a key challenge.

Health care reform is also moving at breakneck speed within Massachusetts' Medicaid program as it shifts incentives for health care systems to be accountable for improving the quality of and lowering the costs of health care, and the strong connection between homelessness and poor health is well understood by state policymakers and the Executive Office of Health and Human Services. Global payments from MassHealth to accountable care organizations (ACOs) will be risk-adjusted for the first time to account for a number of social determinants of health, including homelessness, which will provide additional resources that ACOs should use in an attempt to address underlying homelessness in new ways.

Given the dynamic environment in both housing and health care policy in Massachusetts, many exciting opportunities are within reach. Medicaid ACOs will benefit financially from documenting homelessness and they will be expected to collaborate with community partners who are well positioned to coordinate health care and housing efforts. Although this integration across health care systems and community partners is a tall order, the opportunity to align funding and incentives to improve the health of people experiencing homelessness is unprecedented.

Jessie M. Gaeta, MD, FASAM
Chief Medical Officer, Boston Health Care for the Homeless Program
Assistant Professor of Medicine, Boston University School of Medicine

Policy Perspective

There is growing evidence nationwide that the lack of affordable, stable, high-quality housing is a major cause of both physical and mental health problems — problems that are depriving people of a high quality of life while driving up the cost of health care for everyone. This report documents these troubling trends in Massachusetts, especially for our young, school-age residents.

Fortunately, there are some simple, common-sense, proven solutions that Massachusetts can adopt to address these problems:

1. Build and preserve more affordable housing by increasing the state's allocation of bond dollars to affordable housing and by lifting the current cap on the state low-income housing tax credit program. Indeed, the state has a long pipeline of "ready-to-go" projects across the state that simply can't move forward without additional state funding.
2. Provide more rental subsidies to homeless families and those at risk of homelessness so we can move families out of shelters and motels and into stable, safe private housing. The Massachusetts Rental Voucher Program was cut dramatically in the 1990s and we still have not restored funding to its prior levels, despite rising rents and escalating demand. Increasing the funding and reforming some of the rules to make it easier to find apartments would provide stability to families and children in need.
3. Dramatically increase our investment in housing rehabilitation programs that enable low and moderate income homeowners to address the negative health consequences of poor quality housing. We have a network of nonprofits and municipal agencies that can provide 0% loans to families to address lead paint abatement, mold, infestation, and other problems associated with dilapidated housing. This is an especially serious issue in our gateway cities and rural areas.
4. Support innovative programs that link health dollars to housing so we can provide better services and case management to seniors and people with developmental disabilities, mental health challenges, and other physical limitations. By connecting these services directly to the housing, we can improve quality of life and dignity, while also saving money on nursing home care, emergency room visits, and other costly medical interventions.

For decades, Massachusetts has been a leader in medicine and in affordable housing. The time has come for us to lead the way in linking health and housing directly to improve health outcomes and reduce health costs.

Joseph Kriesberg
President and CEO
Massachusetts Association of Community Development Corporations

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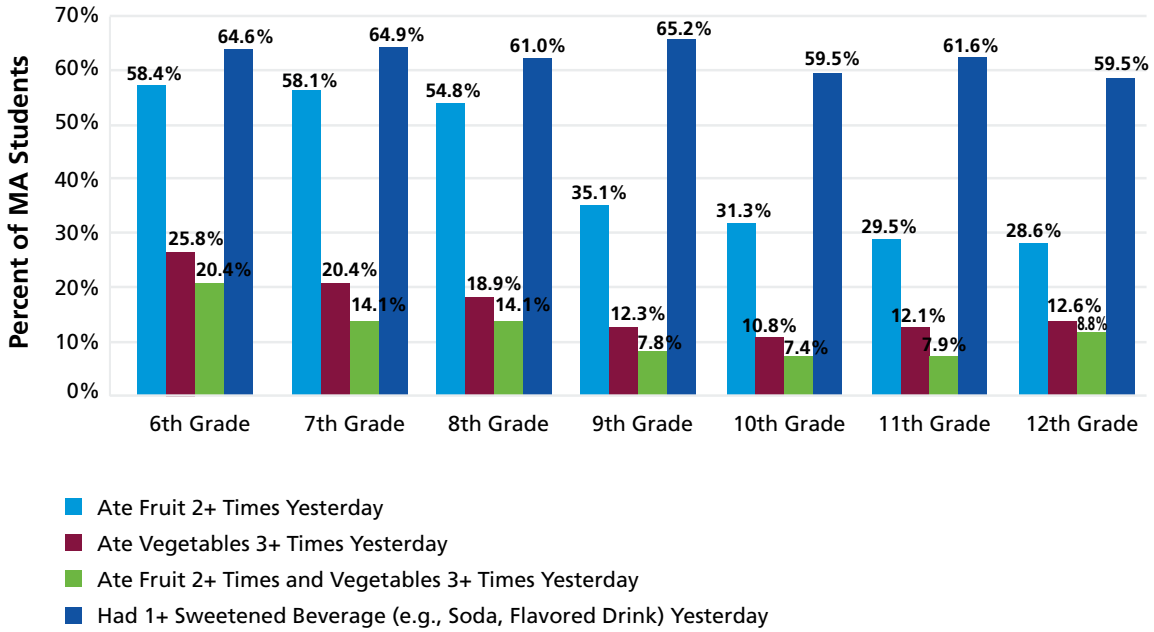
1.4 Nutrition and Food Security

Nutrition, like obesity and overweight, is an important indicator of and contributor to overall health. Good nutrition is important to both children and adults at every stage of life: for infants, children, and teens, good nutrition contributes to improved brain and bone development, optimal immune and digestive system functionality, and reduced risk of obesity and overweight later in life. As adults age, good nutrition also is important to immune system function and to managing chronic diseases such as diabetes and heart disease.

Not all Massachusetts children and adults have access to or consume optimal amounts of nutrient-rich food; significant numbers experience food insecurity. This section reviews recent data on nutrition and food security for population groups in Massachusetts.

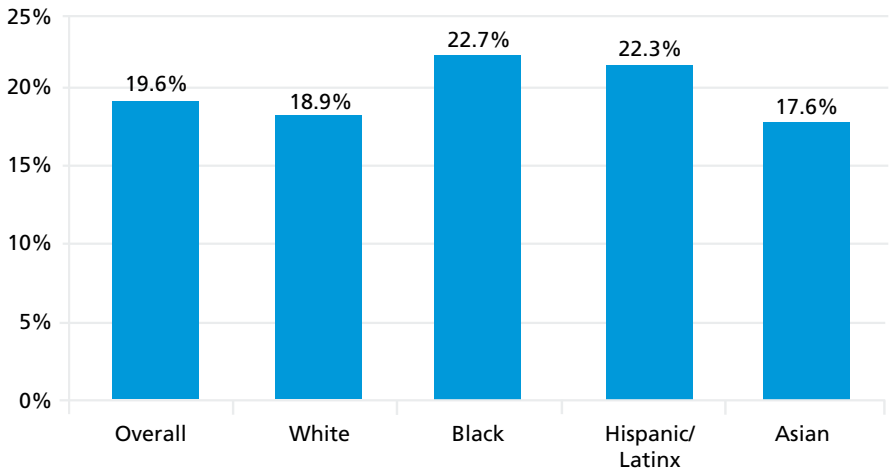
Massachusetts Middle and High School Students' Daily Food and Sweetened Drink Intake, 2015



Source: Massachusetts Department of Public Health and Massachusetts Department of Elementary and Secondary Education, *2015 Report: Health and Risk Behaviors of Massachusetts Youth, Executive Summary*.

- High school students in Massachusetts appear to have less nutritious eating habits than middle school students. Significantly fewer high schoolers consume daily multiple servings of fruits and vegetables than their middle school counterparts.
- Sixth graders reported particularly high fruit *and* vegetable daily intake in 2015: 20.4% of sixth grade students ate fruits more than twice and vegetables more than three times during the reported year.
- Middle school students were slightly more likely than high school students to consume one or more sweetened beverages per day, though about 60% of students at all grade levels drank a sweetened beverage daily.

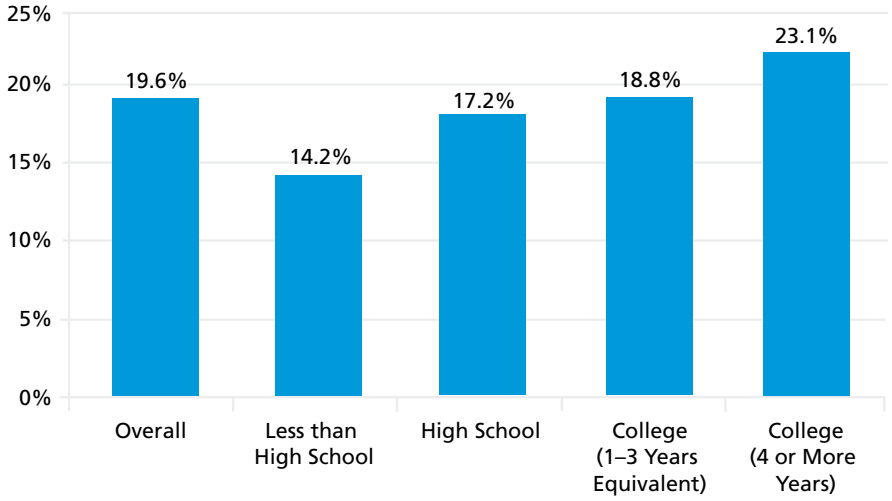
Massachusetts Adults Who Consumed Fruits and Vegetables 5+ Times per Day, by Race/Ethnicity, 2015



Source: Massachusetts Department of Public Health, Office of Data Management and Outcome Assessment, *A Profile of Health among Massachusetts Adults*, 2015.

- About one Massachusetts adult in five consumes five or more servings of fruits and vegetables per day.
- Black and Hispanic/Latinx adults have a somewhat higher rate of fruit and vegetable consumption than White and Asian adults.

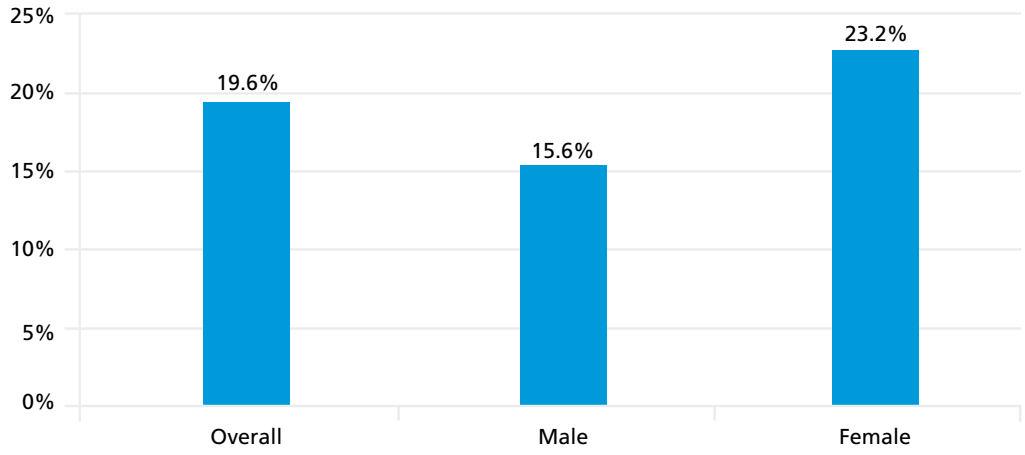
Massachusetts Adults Who Consumed Fruits and Vegetables 5+ Times/Day, by Education Level, 2015



Source: Massachusetts Department of Public Health, Office of Data Management and Outcome Assessment, *A Profile of Health among Massachusetts Adults*, 2015.

- For consumption of nutritional food, the disparities are greater across educational attainment levels than by race and ethnicity. College educated adults in Massachusetts are about 60% more likely than adults without a high school diploma to consume five or more servings of fruit and vegetables per day.

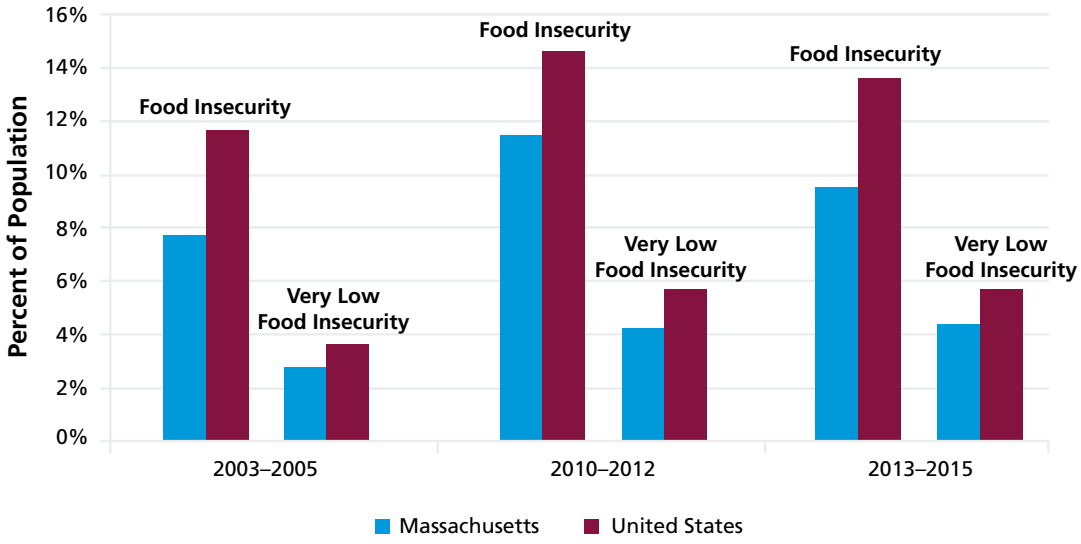
Massachusetts Adults Who Consumed Fruits and Vegetables 5+ Times/Day, by Gender, 2015



Source: Massachusetts Department of Public Health, Office of Data Management and Outcome Assessment, *A Profile of Health among Massachusetts Adults*, 2015.

- Women are much more likely than men to consume substantial amounts of fruits and vegetables.

Trends in Food Insecurity, Massachusetts and the United States



Food Insecurity = Low food security (reports of reduced quality, variety, or desirability of diet, with little or no indication of reduced food intake) OR very low food security (reports of multiple indications of disrupted eating patterns and reduced food intake).

Source: Economic Research Service/USDA, *Household Food Security in the United States in 2015*.

- Food insecurity increased significantly in the decade between 2003 and 2012, but then declined somewhat in recent years; however, the current level of food insecurity remains higher than the average level in 2003–2005.
- The level of food insecurity in Massachusetts is lower than in the nation as whole, but nearly 1 in 10 Massachusetts residents was considered food-insecure on average in 2013–2015.

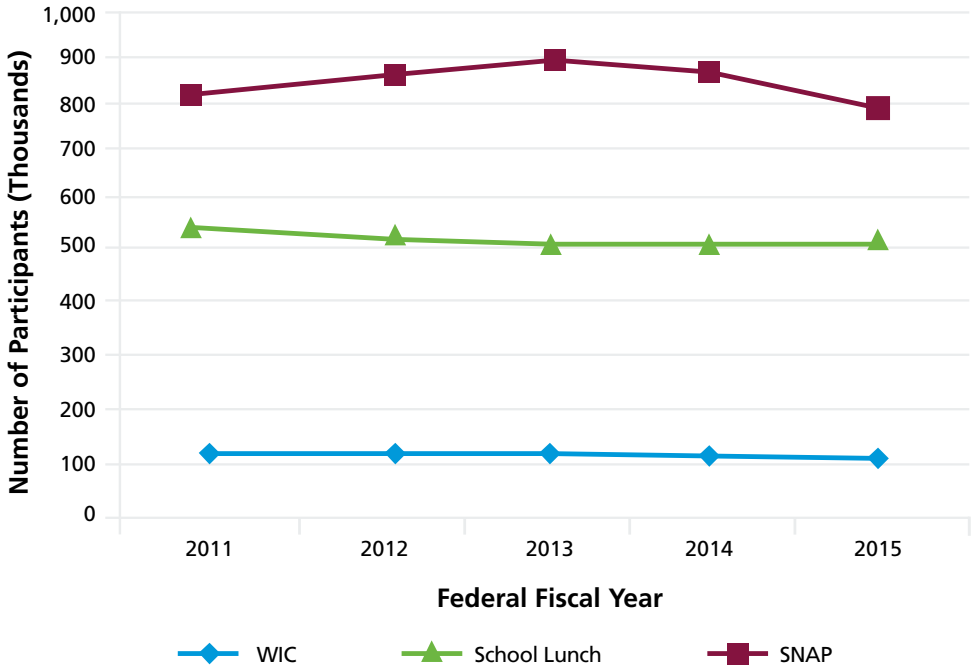
OVERALL FOOD INSECURITY IN MASSACHUSETTS BY COUNTY, 2014

County Name	County Population	Food Insecurity Rate	Estimated Number of Food-Insecure People
Barnstable	215,167	9.9%	21,340
Berkshire	130,064	11.6%	15,080
Bristol	551,065	12.1%	66,650
Dukes	16,915	10.8%	1,830
Essex	757,395	9.0%	67,950
Franklin	71,300	10.4%	7,430
Hampden	466,447	11.7%	54,780
Hampshire	160,328	10.6%	16,990
Middlesex	1,539,832	9.0%	138,930
Nantucket	10,414	10.4%	1,080
Norfolk	682,860	8.7%	59,730
Plymouth	500,772	9.5%	47,430
Suffolk	747,928	15.9%	118,930
Worcester	806,804	10.3%	82,950
State Total	6,745,408	11.1%	745,470

Source: Feeding America, *Map the Meal Gap 2016: Overall Food Insecurity in Massachusetts by County in 2014*.

- Food insecurity varied by county in 2014.[16] Suffolk (15.9%), Bristol (12.1%), and Hampden (11.7%) counties reported higher than average food insecurity rates.
- Overall, about three-quarters of a million people in Massachusetts were food-insecure in 2014.

Massachusetts Residents' Participation in Federal Nutrition Programs

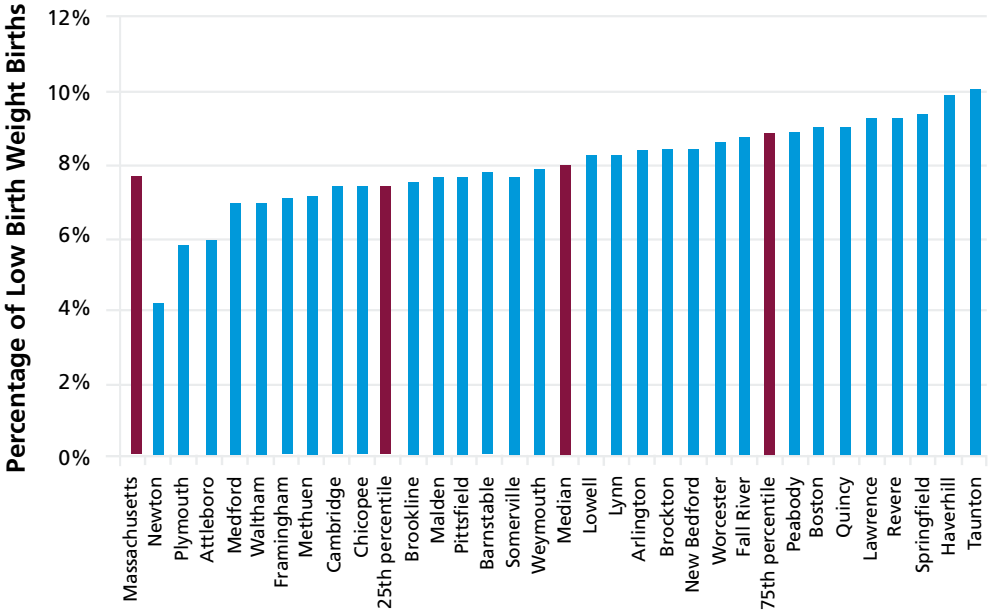


Source: USDA, Food and Nutrition Service.

- Massachusetts provides a variety of federal nutrition programs for its residents. Participation in programs like WIC (Special Supplemental Nutrition Program for Women, Infants, and Children), SNAP (formerly Food Stamps), and School Lunch are often correlated to improved health outcomes, especially for infants and children born to low income families. Since 2011, the number of participants in the WIC and School Lunch programs has remained fairly constant. Participation in the state's SNAP program has varied over the past four years, declining by about 100,000 from its peak in 2013 to 785,778 participants in 2015.

[16]Feeding America. *Map the Meal Gap 2016: Overall Food Insecurity in Massachusetts by County in 2014.* www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2014/MA_AllCounties_CDs_MMG_2014.pdf. Accessed on November 1, 2016.

Percentage of Low Birth Weight Births, Massachusetts and 30 Largest Municipalities, 2014



Low birth weight is under 2,500 grams, or 5.5 lbs.
Source: Massachusetts Department of Public Health, *Massachusetts Births in 2014*.

- There is evidence that participation in WIC reduces the percentage of low birth weight babies born to parents in the United States.[17,18] The statewide low birth weight rate has remained stable over the past decade, declining slightly from 7.8% in 2004 to 7.5% in 2014.
- There is considerable variation in the low birth weight rate across the state's largest municipalities. The probability of a low weight birth is 2.5 times greater for a mother in Taunton than a mother in Newton.
- While many other factors influence birth weight, it is likely that nutrition plays an important role in this variation.

Summary

Access to and consumption of nutritious foods are important determinants of health. While Massachusetts fares better than the country as a whole, a sizable portion of the state's population experiences food insecurity. The level of food insecurity varies by region. There are also disparities in the consumption of healthy foods, across racial and ethnic groups, education levels, and gender. High school students eat fewer fruits and vegetables than middle school students, and more than half of all middle and high school students regularly drink sweetened beverages. There clearly is room for improvement in nutrition and food security, which would in turn improve population health.

[17]Buescher PA et al. Prenatal WIC participation can reduce low birth weight and newborn medical costs: A cost-benefit analysis of WIC participation in North Carolina. *J Am Diet Assoc*. Feb 1993; 93: 2.
[18]Kotelkuck M et al. WIC participation and pregnancy outcomes: Massachusetts Statewide Evaluation Project. *Am J Public Health*. October 1984; 74: 10.

Policy Perspective

Healthy diets high in fruits and vegetables, whole grains, and lean proteins and low in sugar and sodium are critical for preventing chronic disease and ensuring optimal health across the lifespan. The impacts of poor nutrition and food insecurity are well documented. Children from food-insecure households are more likely to be in fair or poor health and to be hospitalized than food-secure children.[19] In adults, food insecurity is linked to chronic diseases including diabetes and hypertension. Food-insecure individuals of all ages are more likely to be overweight or obese due to over-consumption of low-quality, high-calorie foods.

Many neighborhoods in Massachusetts are "food swamps" where unhealthy, processed foods and sugar-sweetened beverages are abundant, inexpensive, and heavily marketed. Low-income residents and people of color are more likely to live in these neighborhoods and less likely to have the money or transportation access that enable healthier choices.

Food purchases routinely compete with housing and other necessities in a family's budget. Since unhealthy food is often less expensive, low-income families are forced to make trade-offs. Nutrition and food security goals are directly linked to income equity goals, including a $15 minimum wage and expanded earned income tax credits.

Turning to policy approaches that are specifically food-focused, the USDA's Supplemental Nutrition Assistance Program (SNAP) is critical to alleviating food insecurity. One common-sense approach for Massachusetts is to ensure enrollment of all eligible individuals. Creating a common application portal with MassHealth would reduce the "SNAP Gap" by connecting an estimated half-million residents with the benefits for which they are likely eligible.[20] Investments in other nutrition programs, including the National School Breakfast and Lunch Programs, and efforts to increase their uptake are also vital.

We can incentivize customers making healthier food purchases while supporting local agriculture. Since 2008, the Boston Bounty Bucks program has allowed SNAP participants to double their purchasing power at farmer markets. We support the Commonwealth's work to take this model to scale through the new Healthy Incentives Program (HIP) and encourage its adoption statewide.[21] These types of policy initiatives will help ensure that all Massachusetts residents have adequate resources and knowledge to purchase, prepare, and enjoy a nutritious diet.

Monica Valdes Lupi, JD, MPH
Executive Director
Boston Public Health Commission

[19] Cook JT, Frank DA, Leveson SM, et al. Child food insecurity increases risks posed by household food insecurity to young children's health. *J Nutr.* 2006; 136: 1073–1076.
[20] *What is the Massachusetts SNAP Gap.* www.masslegalservices.org/content/its-time-close-massachusetts-snap-gap.
[21] Bartlett SP, Klerman J, Olsho L, et al. *Evaluation of the Healthy Incentives Pilot (HIP): Final Report.* Prepared by Abt Associates for the U.S. Department of Agriculture, Food and Nutrition Service, September 2014. Evaluation of the HIP pilot showed a significant increase in fruit and vegetable consumption by participants.

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Kotelkuck M et al, WIC participation and pregnancy outcomes: Massachusetts Statewide Evaluation Project. *Am J Public Health*. October 1984; 74: 10.

Massachusetts Department of Public Health and Massachusetts Department of Elementary and Secondary Education. *2015 report: Health and risk behaviors of Massachusetts youth — executive summary*. www.mass.gov/eohhs/docs/dph/behavioral-risk/youth-health-risk-report-2015.pdf. Accessed November 21, 2016.

Massachusetts Department of Public Health. *Massachusetts births in 2014*. www.mass.gov/eohhs/docs/dph/research-epi/birth-report-2014.pdf. Published September 2015. Accessed November 22, 2016.

Massachusetts Department of Public Health's Office of Data Management and Outcome Assessment. *A profile of health among Massachusetts adults, 2015: Results from the Behavioral Risk Factor Surveillance System*. September 2016. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2015.pdf. Accessed November 22, 2016.

U.S. Department of Agriculture, Economic Research Service. *Household Food Security in the United States in 2015*. Report ERR-215. September 2016.

U.S. Department of Agriculture, Food and Nutrition Service. Program Data. www.fns.usda.gov/pd/overview. Accessed November 22, 2016.

Disease-Related Malnutrition*: An Effort to Better Understand Its Effects and Strategies for Addressing It

The following excerpts are from an article titled "Economic Burden of Disease-Associated Malnutrition at the State Level," published in PLOS ONE on September 21, 2016 (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161833):

> Disease-associated malnutrition [DAM] has been identified as a prevalent condition, particularly for the elderly, which has often been overlooked in the U.S. healthcare system. The state-level burden of community-based, disease-associated malnutrition is unknown and there have been limited efforts by state policy makers to identify, quantify, and address malnutrition. The objective of this study was to examine and quantify the state-level economic burden of disease-associated malnutrition. . . .

*Malnutrition triggered by illness or disease or certain treatments for those conditions

> National disease and malnutrition prevalence rates were estimated for subgroups defined by age, race, and sex using the National Health and Nutrition Examination Survey and the National Health Interview Survey. State prevalence of disease-associated malnutrition was estimated by combining national prevalence estimates with states' demographic data from the U.S. Census. Direct medical cost for each state was estimated as the increased expenditures incurred as a result of malnutrition. . . .
>
> Direct medical costs attributable to disease-associated malnutrition vary among states and nationally the annual cost of disease-associated malnutrition is over $15.5 billion. The elderly bear a disproportionate share of this cost on both the state and national level. . . .
>
> Additional action is needed to reduce the economic impact of disease-associated malnutrition, particularly at the state level. Nutrition may be a cost-effective way to help address high health care costs.

Estimates of the annual state-specific burden of direct medical spending on DAM are presented in the above article, including Massachusetts at over $322,000,000. California has the largest estimated burden of DAM with direct medical expenditures of over $1.7 billion annually. Texas, Florida, and New York face a significant burden of DAM with estimated expenditures of over $1 billion annually.

In 2015, the Massachusetts Health Council declared its support for a bill in the Massachusetts Legislature titled "An Act Establishing a Commission on Malnutrition Prevention." This is the description of the most recent version of the bill, which has been progressing through the Legislature:

> S.2499: An Act Establishing a Malnutrition Commission among Older Adults. The commission shall make an investigation and comprehensive study of the effects of malnutrition on older adults and of the most effective strategies for reducing it. The commission shall monitor the effects that malnutrition has on health care costs and outcomes, quality indicators and quality of life measures on older adults.

These are excerpts from the Council's letter to the Joint Committee on Public Health:

> The Massachusetts Health Council tracks and reports regularly on public health indicators that are related to nutrition — including poverty, obesity and diabetes — but not malnutrition itself and we would like to have access to more data. . . .
>
> A Malnutrition Prevention Commission will provide the expert focus that is needed on this under-recognized health issue. It will provide the data we need on the extent, effects and costs of malnutrition in older adults and identify evidence-based strategies and policies for intervention and prevention of this condition."

We are pleased to report that, on November 29, 2016, S.2499 was signed into law by Governor Baker as Chapter 325 of the Acts of 2016.

1.5 Access to and Affordability of Care

Overview

Access to health care is an important indicator of and contributor to good overall health care. When compared to the national average, more adults in Massachusetts have access to health insurance: 95.7% of all non-elderly adults in Massachusetts had health insurance coverage at some point in 2015, a figure higher than the national average during the same year (87.3%). Both adults and children faced challenges in accessing needed health care services in 2015, primarily due to cost, insurance, and scheduling issues. Without access to quality, affordable health care, vulnerable populations — low-income individuals and families, homeless people, and those with chronic health conditions — cannot address short- and long-term health needs and may face adverse changes to their health. Although Massachusetts' health reform in 2006 and national health reform in 2010 expanded opportunities for residents to receive needed care, gaps in access remain. Access to care is also connected to other social determinants of health, such as education and poverty.

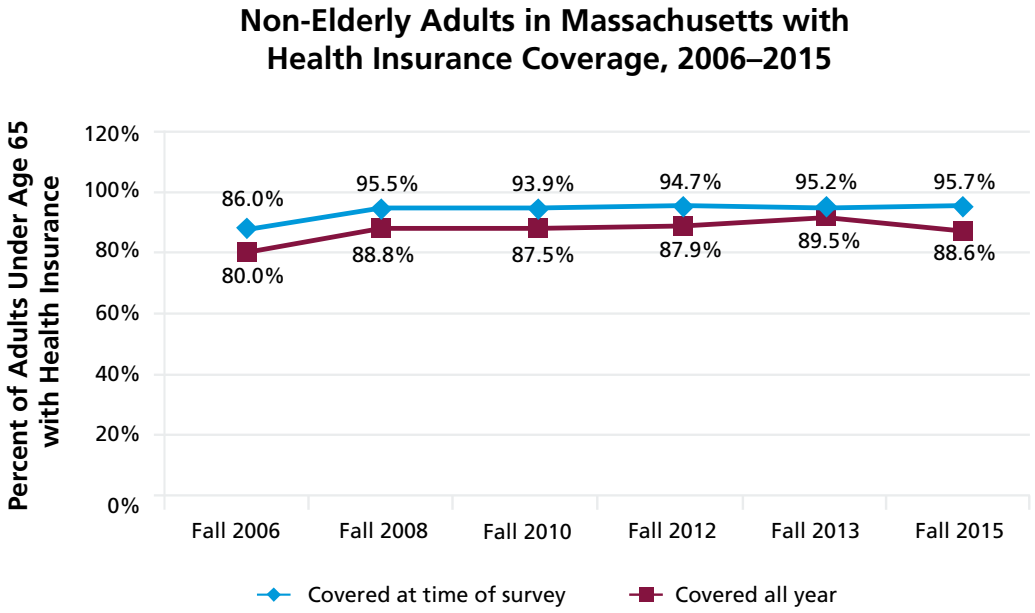
Defining Health Care Access

Access to health care is best described as "the timely use of personal health services to achieve the best health outcomes."[22] More specifically, access has three major components: gaining initial entry to the health care system (usually associated with health insurance coverage); gaining access to sites of care where patients can receive needed services; and finding providers who meet the needs of patients and facilitate meaningful relationships.[23] In other words, access to health care is more than health insurance coverage: it encompasses other social, educational, and historic factors that affect when and how people use health care services. A lack of access to health care also affects the financial and social well-being of residents in need. For this report, we focus on access to primary, oral, and preventive health care services.

[22]Clancy C, Munier W, et al. Chapter 9: Access to healthcare. www.ahrq.gov/research/findings/nhqrdr/nhqr11/chap9.html. Accessed November 23, 2016.
[23]*Id.*

Trends

Access to health care in Massachusetts has seen steady improvements over the past decade. In recent years, new laws have expanded health insurance coverage options for children and adults under 65. Since enactment of the Affordable Care Act, Massachusetts and the nation have seen an increase in the number of people who have access to health insurance coverage. In 2015, 95.7% of all non-elderly Massachusetts residents had some form of insurance coverage. This number is higher than the national average (87.3%) during the same period.



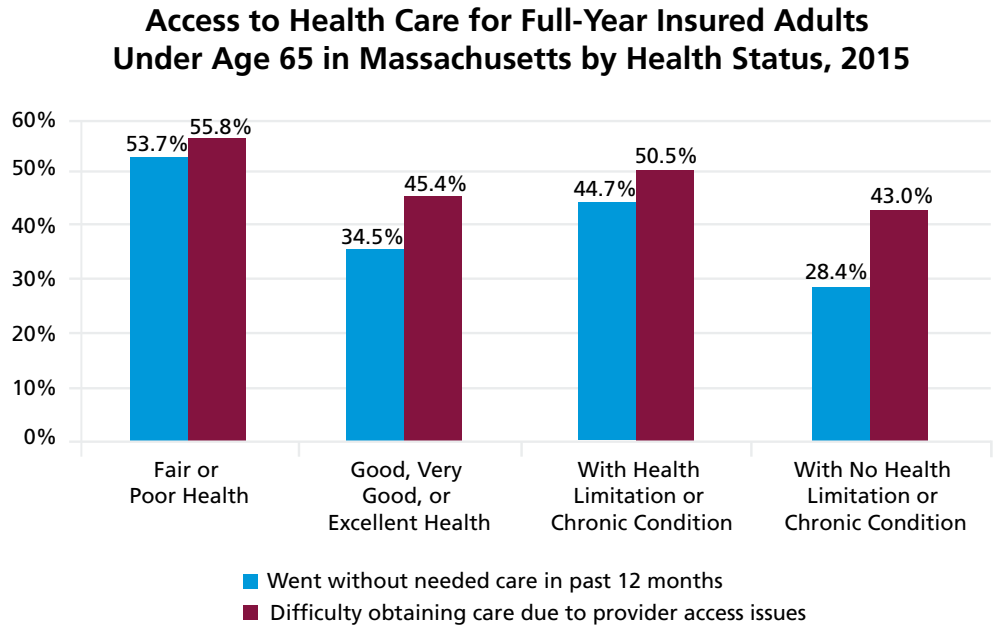
Source: Blue Cross Blue Shield of Massachusetts Foundation, *2015 Massachusetts Health Reform Survey*.

Massachusetts has a high level of medical and dental insurance coverage for non-elderly adults:

- In 2015, 19 out of 20 non-elderly adults (95.7%) in Massachusetts said they had health insurance at the time they were surveyed; 88.6% had insurance coverage for the entire year. More than half (57.3%)% of these adults had employer-sponsored health insurance, and 38.3% of health insurance from another source (individual private coverage, or public coverage such as MassHealth, Commonwealth Care, or Medicare).[24]
- 73.4% of all non-elderly Massachusetts adults had some form of dental insurance in 2015, considerably lower than the health insurance coverage rate.[25]

[24]Long S. *Health insurance coverage and health care access and affordability in Massachusetts: 2015 update.* http://bluecrossfoundation.org/sites/default/files/download/publication/MHRS_2015_Report_FINAL.pdf. 2015: 6. Accessed November 22, 2016.
[25]Long S. *Health insurance coverage and health care access and affordability in Massachusetts: 2015 update.* http://bluecrossfoundation.org/sites/default/files/download/publication/MHRS_2015_Report_FINAL.pdf. 2015: 16. Accessed November 22, 2016.

- Most insured adults had good access to health care. In 2015, 85.8% of all adults, and 87.8% of adults with year-round coverage, said they had a usual source of health care outside of the emergency room.[26]

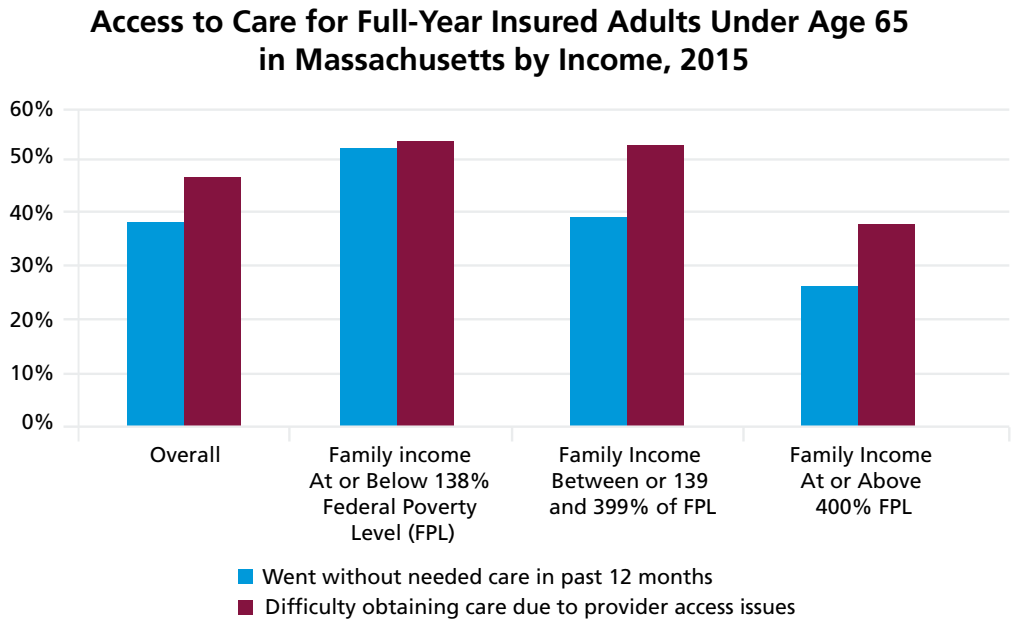


Source: Blue Cross Blue Shield of Massachusetts Foundation, *2015 Massachusetts Health Reform Survey.*

Even with insurance, timely access to a health care provider is still a concern for many adults in Massachusetts, especially those with poor health, health limitations, and chronic diseases:

- Over a third of adults (34.5%) with health insurance and in good or excellent health went without health care they said they needed in 2015.
- Forgone care was even more common for adults who tend to need more of it: 44.7% of adults with a health limitation or chronic condition and 53.7% of adults in fair or poor health went without needed health care in 2015.
- Massachusetts adults reported difficulty obtaining care due to provider access issues in even higher numbers. Access issues include finding a provider that accepts their health insurance and scheduling an appointment when needed.
- More than half of adults in fair or poor health, or reporting having a chronic condition, had such access challenges, and only a slightly lower proportion of healthier adults reported the same.

[26]Long S. *Health insurance coverage and health care access and affordability in Massachusetts: 2015 update.* http://bluecrossfoundation.org/sites/default/files/download/publication/MHRS_2015_Report_FINAL.pdf. 2015: 20. Accessed November 22, 2016.



Source: Massachusetts Blue Cross Blue Shield of Massachusetts Foundation, *2015 Massachusetts Health Reform Survey.*

- Access to care among adults with year-round health insurance varied by income. This is because a common reason for going without needed care is the out-of-pocket costs (deductibles or copayments) an individual faces can be a deterrent to seeking care.
- Overall, nearly 4 adults in 10 (37.2%) who had year-round insurance went without needed care during the year. Members of lower-income families are more likely to report this (more than half, in fact), and members of higher-income families are less likely.
- There is a similar pattern for insured adults reporting provider access issues (such as a provider not accepting a particular type of insurance or difficulty in getting a timely appointment).
- Though members of higher-income families were less likely to experience challenges accessing care, a sizable percentage of even these families — which have incomes more than four times the poverty level — experienced access challenges.
- Nearly all children (97.8%) had access to a usual source of care in 2015,[27] and most (94.6%) saw a doctor within the past year.[28] When asked about major barriers to health care for children, respondents to a state survey cited limited health insurance acceptance, scheduling challenges, high out-of-pocket costs, and challenges affording the cost of health care services as the major barriers to care. Nearly 4 in 10 respondents (38.9%) reported having out-of-pocket costs greater than $1,000 over the past year, and 17.4% said they faced challenges paying their health care bills.[29] Almost one-tenth (8.8%) of respondents were told that the doctor's office or clinic where they sought services did not accept their health insurance type, and 17.4% said they had difficulty scheduling an appointment when they needed it.[30]

[27]Skopec L, Long S, et al. Findings from the *2015 Massachusetts Health Information Survey*. Accessed from www.chiamass.gov/assets/docs/r/survey/mhis-2015/2015-MHIS.pdf. 2015: 20. Accessed November 22, 2016.
[28]Skopec L, Long S, et al. Findings from the *2015 Massachusetts Health Information Survey*. Accessed from www.chiamass.gov/assets/docs/r/survey/mhis-2015/2015-MHIS.pdf. 2015: 21. Accessed November 22, 2016.
[29]Skopec L, Long S, et al. Findings from the *2015 Massachusetts Health Information Survey*. Accessed from www.chiamass.gov/assets/docs/r/survey/mhis-2015/2015-MHIS.pdf. 2015: 37. Accessed November 23, 2016.
[30]Skopec L, Long S, et al. Findings from the *2015 Massachusetts Health Information Survey*. Accessed from www.chiamass.gov/assets/docs/r/survey/mhis-2015/2015-MHIS.pdf. 2015: 33. Accessed November 23, 2016.

Geographic Variation

A nationwide analysis of county health rankings includes measures of access to care, including the percentage of adults without health insurance and population-to-provider ratios. Among Massachusetts counties, Norfolk and Hampshire counties had the highest ranking for "clinical care."[31] Dukes and Nantucket counties had the lowest ranking.[32]

MASSACHUSETTS COUNTY RANKINGS FOR CLINICAL CARE	
County	**Rank**
Norfolk	1
Hampshire	2
Berkshire	3
Barnstable	4
Middlesex	5
Suffolk	6
Franklin	7
Plymouth	8
Worcester	9
Essex	10
Bristol	11
Hampden	12
Dukes	13
Nantucket	14

Source: University of Wisconsin Population Health Institute and Robert Wood Johnson Foundation, *2016 County Health Rankings: Massachusetts.*

Summary

Access to care, as measured by health insurance coverage, is higher in Massachusetts than in any other state in the country. There are still access concerns, however. Certain groups — many of which have greater-than-average needs for health care — have lower rates of insurance coverage. And even those who are insured year-round do not have unfettered access because of barriers such as out-of-pocket costs and provider availability. Access also varies across geographic regions of the state.

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[31]"Clinical Care" includes access measures (uninsured rate and provider to population ratios for primary care physicians, dentists, and mental health providers) and quality measures (preventable hospital stays, diabetes monitoring and mammography screening). More information about key terms and definitions related to clinical care from the 2016 County Health Rankings Report can be found at www.countyhealthrankings.org/our-approach/health-factors/access-care.

[32]University of Wisconsin Population Health Institute and Robert Wood Johnson Foundation. *2016 County Health Rankings*. www.countyhealthrankings.org/sites/default/files/state/downloads/CHR2016_MA.pdf. 2016: 6. Accessed November 23, 2016.

Policy Perspective

Massachusetts achieved near-universal health insurance coverage with its ground-breaking 2006 health reform legislation (Chapter 58) and has maintained the lowest level of uninsurance in the nation ever since. Uninsurance in the Bay State was down to only 2.5% in 2015 following the roll-out of the federal Affordable Care Act. While expanding coverage to nearly 600,000 additional Bay Staters since 2006 is worthy of celebration, there is still work to be done.

Health insurance coverage alone doesn't guarantee access to affordable health care. Regrettably, gaps in access to care and affordability persist for some Massachusetts residents despite their having health insurance coverage all year. In the 2015 Massachusetts Health Reform Survey, nearly one in five adults who had coverage all year reported going without needed health care because of costs, and one in five reported reducing spending on other needs or making other trade-offs to afford their family's health care. Those trade-offs can be hard.

Here's a real-life example: A single mom diagnosed with Type I diabetes and high blood pressure reported out-of-pocket costs of $200 a month for the testing supplies, insulin, and other prescription drugs she needed to manage her health. After struggling with this expense, she tried to cut back on insulin by eating less so her blood sugar would drop. But that strategy backfired when her lab results showed that she was no longer controlling her diabetes, raising the risk of serious complications. To cover the cost of managing her diabetes, the mom decided to give up her apartment and move in with her own mother — a trade-off she would have preferred not to have had to make.

The burden of high health care costs isn't a surprise in Massachusetts; the state has been tracking costs for years, most recently through the Health Policy Commission. However, health care costs in Massachusetts continue to increase faster than the rate of inflation, and families across the state continue to struggle.

The state's shift toward value-based purchasing in the private sector and MassHealth has the potential to move Massachusetts toward a more cost-effective and efficient health care system that pays for the value of the care provided rather the volume of services delivered.

Massachusetts led the way in expanding health insurance coverage in 2006 and can lead the way again by tackling health care costs so health insurance coverage can guarantee access to affordable health care in the state.

Audrey Shelto
President
Blue Cross Blue Shield of Massachusetts Foundation

SOURCES

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Chapter 2

Health Risk Factors

Certain individual behaviors, while not health conditions themselves, increase the risk of poor health. These risk factors differ from social determinants in that they are within the control of an individual to change. Tobacco use is probably the best known of these risk factors and one of the most detrimental to health.

2.1 Tobacco Use

Overview

Use of tobacco is a leading cause of death in the United States and in Massachusetts.[33] Cigarette smoking causes more than 480,000 deaths across the country each year. In Massachusetts, 9,300 adults per year die from tobacco-related causes.[34]

Smoking causes about 90% of all lung cancer deaths in the United States and is estimated to increase the risk of coronary heart disease and stroke by two to four times. Smoking can cause cancer in many parts of the body, harms nearly every organ of the body, and affects a person's overall health. The risk of developing diabetes is 30 to 40% higher for active smokers than for non-smokers.[35]

Smoking also increases the risk for preterm delivery among pregnant women, low birth weight babies, and stillbirth and SIDS.

Smoking is more prevalent among populations who have other risk factors for poor health, such as poverty and lack of education, which amplifies its effect.

While public health policies addressing smoking over the last several decades have resulted in decreased rates of smoking, electronic cigarettes or vaping are new to the market, and there is a rapid increase in the use of these tobacco products.[36] E-cigarettes contain nicotine, a highly addictive substance that has been shown to cause long-term harm to the developing brain and lung function in newborns. Nicotine also has a negative impact on adolescent brain development.[37] These tobacco products should not be considered safe, though more research is needed on all the ingredients and the full health impacts of e-cigarettes.

Continuing to address the health behavior of tobacco use, especially in its newer forms, will remain a critical public health function.

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[33]Centers for Disease Control and Prevention. Health effects of cigarette smoking. www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking.
[34]Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs — 2014.*
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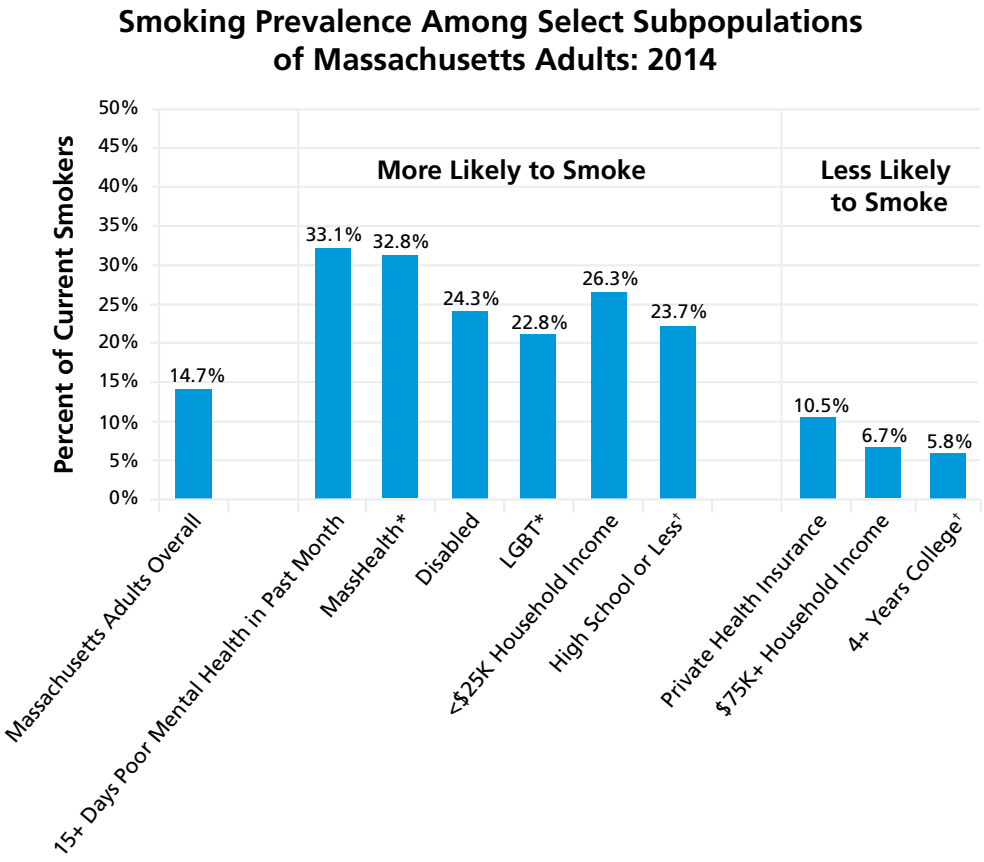
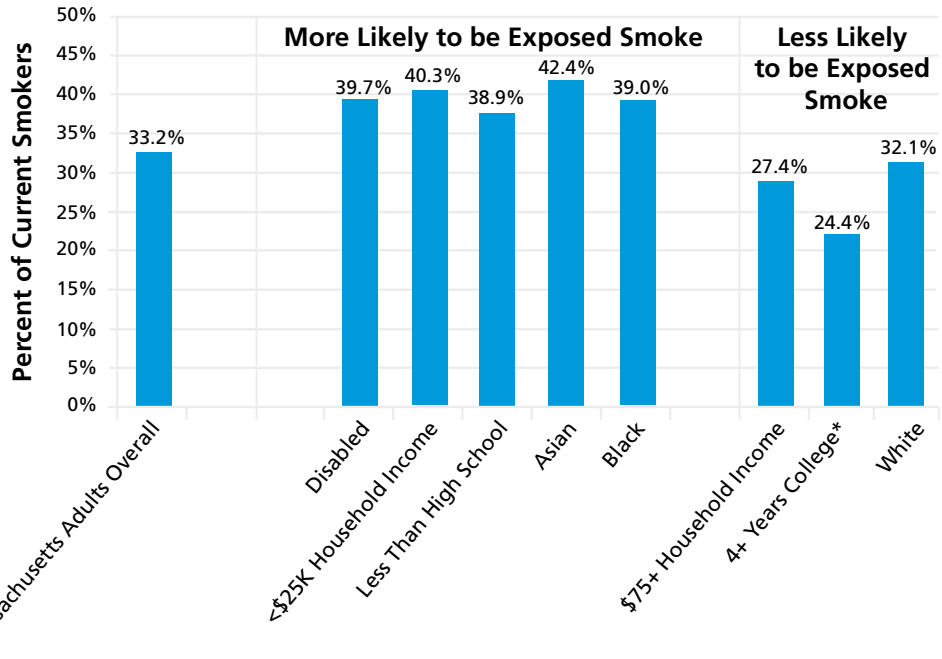
Trends



*Adults age 18–64. †Adults age 25+.
Source: Massachusetts Department of Public Health, *Tobacco Fact Sheet, 2014*.

- Those more likely to smoke are those who are poorer, with less education, enrolled in MassHealth and with poor mental health.
- Lesbian, gay, bisexual, and transgender (LGBT) people also have higher rates of smoking.
- Those with higher incomes and those with four-year college degrees are less likely to smoke.
- Since smoking is much more prevalent among those covered by MassHealth — triple the rate of privately insured people — the cost impact of smoking on health care falls more on the public health care system than the private insurance system.

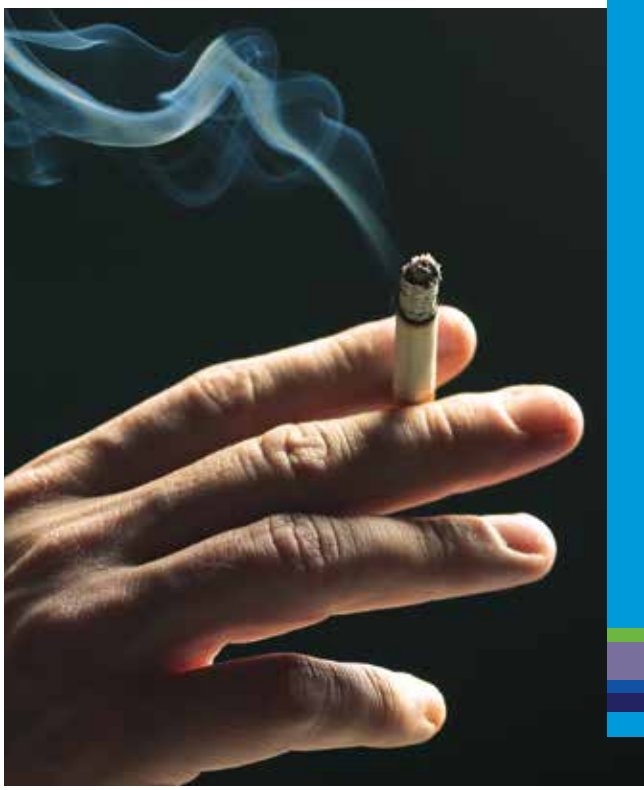
Exposure to Environmental Tobacco, Massachusetts Adults, 2015



*Adults age 25+.

Source: Massachusetts Department of Public Health, *Tobacco Fact Sheet, 2014*.

- In 2015, one-third of the adult population was exposed to environmental smoke at home, work, or other places.
- While there are similar disproportional impacts on those who are poorer and less educated, the differences are less pronounced than with direct smoking. For example, while only 6.7% of those with a household income over $75,000 smoke, 27.4% of this group are exposed to environmental smoke at home, work, or other places.

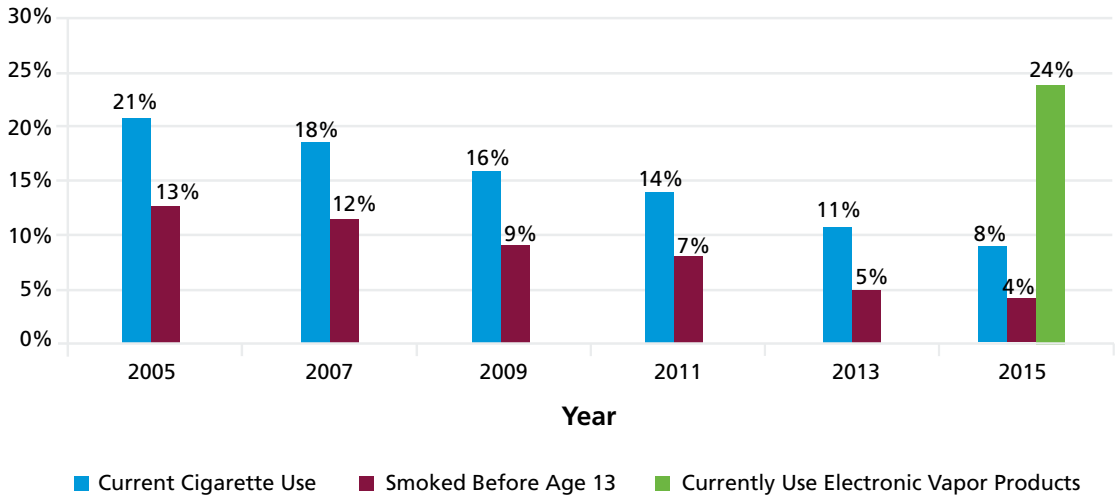


Cigarette Packs Per Capita Sold by Cigarette Tax Rate in Massachusetts, 2005–2015

Source: Orzechowski and Walker. *The Tax Burden on Tobacco*, Arlington (VA): Orzechowski and Walker, 2014.

- The per capita rate of cigarette sales is closely associated with the tax rate on cigarettes. In Massachusetts, each time the sales tax on cigarettes has been raised, there is a large drop in the number of cigarette packs sold. While this is an appealing public health approach, it also is fiscally regressive, as the burden of the tax falls disproportionately on those who are less able to afford them.
- Massachusetts cigarette taxes currently do not apply to electronic cigarettes, the use of which is increasing.

Cigarette and e-Vapor Use Among Massachusetts High School Students: 2005–2015

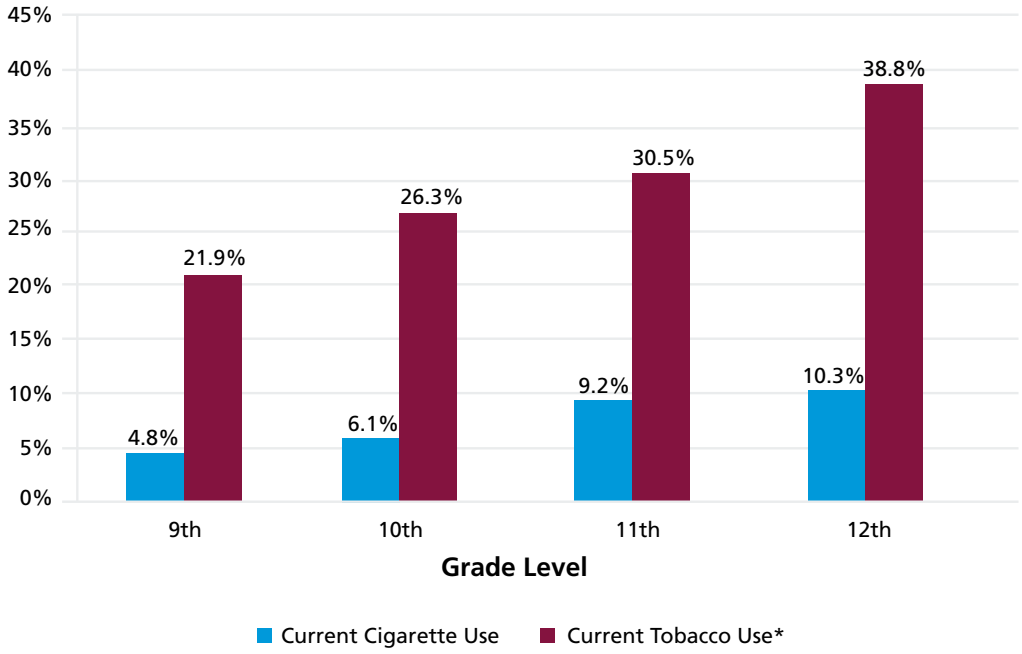


Data Source: U.S. Centers for Disease Control, *Youth Risk Behavior Survey*.

- Cigarette smoking rates have fallen dramatically over the last 10 years among Massachusetts high school students, and smoking among those under 13 is very low.
- However, smoking has largely been replaced by electronic vapor products. The year 2015 is the first year data were collected on youth "vaping"; it appears that once vaping is included, there has not been a reduction in use of tobacco among high school students. Only 2.7% of adults reported using electronic cigarettes in 2015.

- In September 2015, Massachusetts established regulation of electronic cigarettes that prohibited sale of these products to minors under 18. Prior to this regulation, Massachusetts had no prohibition on selling electronic cigarettes to children.

Current Tobacco Use* Among Massachusetts Students by Grade Level: 2015



**Current tobacco use defined as reported use of cigarette, cigar, smokeless or vapor in past 30 days.*
Data Source: U.S. Centers for Disease Control, *Youth Risk Behavior Survey*.

- Both smoking and vaping increase as youth age in high school. While cigarette smoking remains relatively low among 12th graders, 39% of high school seniors report using tobacco in some form.

Summary

While adult smoking rates continue to decline, use of tobacco continues to be a health behavior that puts a significant portion of Massachusetts residents at risk to adverse health outcomes. The increased use of electronic cigarettes among youth is exposing a new generation to nicotine addiction, and the public health impact of smoking and exposure to environmental smoke remains significant.

Policy Perspective

In Massachusetts, more than 9,000 adults die from smoking each year. According to a 2014 report by the U.S. Surgeon General, over 100,000 Massachusetts kids alive today under the age of 18 will die prematurely from smoking. The Centers for Disease Control and Prevention (CDC) estimates that annual health care costs in Massachusetts directly caused by smoking exceed $4 billion.

While we've made progress against Big Tobacco, much work remains. When it comes to evidence-based ways to reduce tobacco use, Massachusetts has taken some major steps passing significant, and regular, tobacco tax increases on cigarettes and "other tobacco products" (OTP). Additionally, our smoke-free workplace law ensures that workers throughout the Commonwealth

are protected from deadly secondhand smoke. These initiatives should be celebrated but work must continue if we are to make an impact on the nearly 15% of adults who still smoke.

The 2014 U.S. Surgeon General's report concluded that comprehensive tobacco control programs prevent and reduce tobacco use by keeping young people from becoming addicted and helping individuals who use tobacco to quit. This is an area where Massachusetts must improve. Currently, the Massachusetts Tobacco Cessation and Prevention program at the Department of Public Health is funded at $3.9 million — only 5.9% of what the CDC recommends and 0.4% of the $880 million the Commonwealth receives in tobacco tax and Master Settlement revenue.

Additionally, the best way to reduce tobacco use is to prevent it altogether. With 95% of adult smokers starting before the age of 21, Massachusetts should increase the age of sale for tobacco products, including electronic cigarettes, from 18 to 21. A 2015 report by the Institute of Medicine backs this up, predicting that tobacco use would decrease by 12% by the time today's teenagers were adults if the minimum age of sale were increased to 21 years across the United States. Further actions which would decrease the places where kids are exposed to smoking and other tobacco products would be to prohibit the sale of tobacco products in health care facilities such as pharmacies and including electronic cigarettes and related products within the Commonwealth's smoke-free workplace law.

Over 25 years ago, Massachusetts defined what tobacco control policies should look like. Addressing these policies would once again make the Commonwealth a leader in the fight against Big Tobacco and ensure that we have some of the strongest anti-tobacco policies in the nation.

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Director of Government Relations
American Cancer Society Cancer Action Network

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Chapter 3

Preventable Health Conditions

This chapter focuses on chronic illnesses and other health conditions whose occurrence or severity is susceptible to preventive measures. They are also affected by the social determinants and risk factors reviewed in the previous chapters. Asthma and obesity are common ailments affecting Americans (especially children, in the case of asthma). HIV/AIDS, hepatitis, and injuries resulting from violence are persistent chronic conditions that disproportionately affect certain groups within the larger population. Substance use disorders, particularly those involving opioids, are a current public health crisis. Mental illness and oral disease also warrant attention because attention has sometimes been lacking and because their presence can exacerbate other conditions, leading to worse health outcomes and higher costs to the system.

3.1 Asthma

Overview

About 24 million Americans have asthma, including about 10% of school-age children and more than 7% of adults. Asthma is the reason for one-third of absences among high school students, and children with persistent asthma are more than three times as likely as other children to miss 10 or more days of school.[38] It is also responsible for millions of missed work days among adults and costs society more than $50 billion per year in medical expenses, productivity loss, and premature death.[39]

Asthma is a chronic respiratory disease affecting the airways that carry oxygen to and from the lungs. An asthma attack is characterized by wheezing, breathlessness, chest tightness, and coughing. Asthma attacks, when not adequately controlled, can lead to emergency room use, hospitalization, and death. Among common triggers of asthma attacks are air pollution, pets, smoke from burning wood, and several of the social determinants of health and other risk factor described elsewhere in this report: tobacco smoke and allergens in the home such as dust mites, cockroach allergen, and mold.[40] There are socioeconomic and racial disparities in asthma prevalence. It is more common among African American, Native American, and Puerto Rican children; women; low-income families; and inner city residents. There are also disparities in asthma outcomes: Puerto Rican children have the highest rates of asthma attacks and deaths due to asthma, and African Americans are three times more likely than Whites to be hospitalized or die because of asthma. The percentage of people with asthma taking controller medication daily is lower among Latinxs and African Americans than among Whites.[41]

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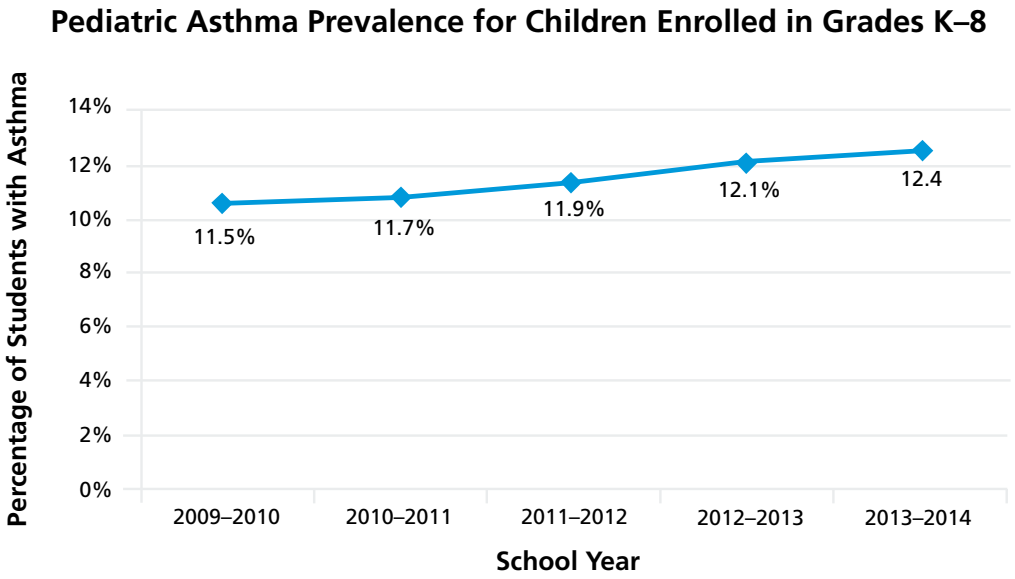
[38]National Collaborative on Education and Health. Leading health conditions impacting student attendance. https://healthyschoolscampaign.org/wp-content/uploads/2015/12/School-Health-and-Attendance-Chart.pdf. Accessed October 5, 2016.
[39]Centers for Disease Control and Prevention. *Asthma facts: CDC's National Asthma Control Program grantees.* July 2013.
[40]Centers for Disease Control and Prevention. *Learn how to control asthma.*
[41]National Heart, Lung, and Blood Institute. *Reducing asthma disparities.* www.nhlbi.nih.gov/health-pro/resources/lung/naci/discover/disparities.htm. Accessed October 5, 2016.

Trends



Source: Massachusetts Department of Public Health, Bureau of Environmental Health.

- The asthma prevalence rate for Massachusetts schoolchildren increased steadily over the most recent five school years for which data are available.
- The raw number of children with asthma increased by 5,000 students — from 80,440 in 2009–2010 to 85,355 in 2013–2014.

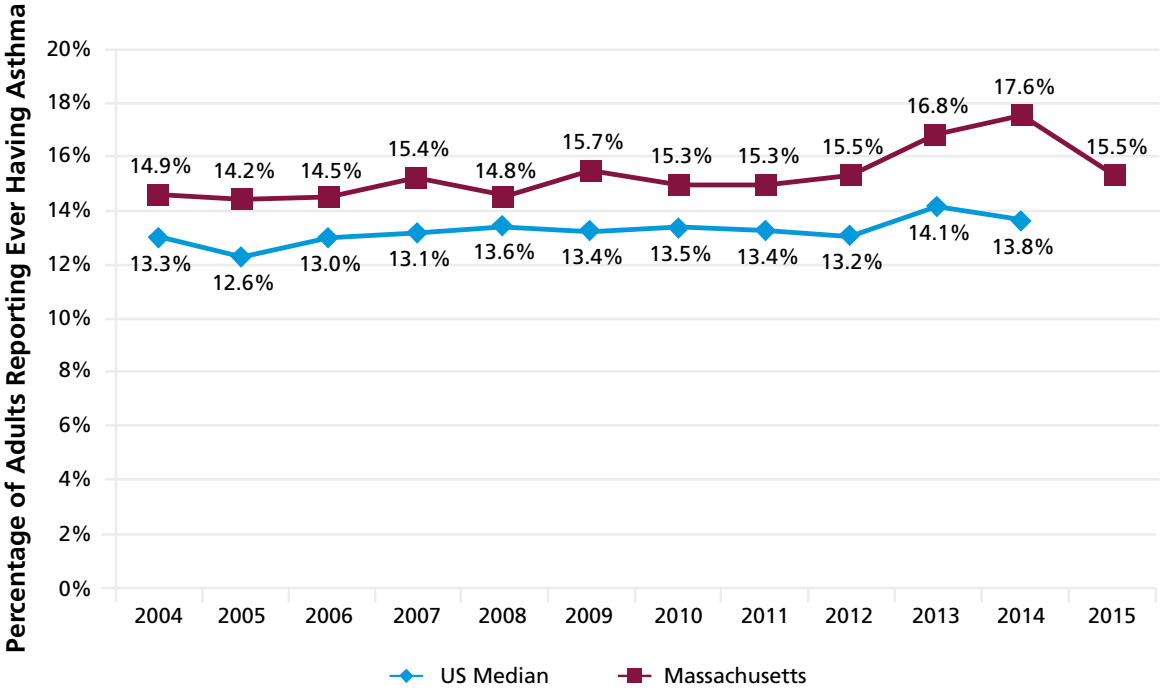
- Thirty-nine communities in Massachusetts had pediatric asthma rates statistically significantly higher than the state rate of 12.4%:

COMMUNITIES WITH CHILD ASTHMA RATES STATISTICALLY ABOVE STATE RATE, 2013–2014 SCHOOL YEAR

COMMUNITY	ASTHMA PREVALENCE (PERCENTAGE OF CHILDREN GRADES K–8)
Athol	17.7
Boston	17.3
Brimfield	16.7
Brockton	16.6
Chicopee	16.2
Dartmouth	15.8
Dracut	15.4
East Longmeadow	15.6
Fall River	17.3
Falmouth	16.1
Fitchburg	15.8
Gardner	19.4
Granby	18.9
Holland	30.6
Holyoke	28.1
Lanesborough	18.2
Lawrence	18.1
Lowell	15.1
Lynn	13.6
Mansfield	16.2
Marlborough	13.6
Medfield	14.3
Monson	19.7
New Bedford	15.5
North Attleborough	15.0
Northampton	15.2
Orange	15.6
Palmer	18.3
Pittsfield	15.3
Plainville	17.4
Randolph	16.8
Southampton	17.0
Southbridge	23.2
Southwick	17.6
Springfield	18.6
Swansea	16.4
Templeton	16.1
Townsend	15.3
Tyngsborough	14.8

Source: Massachusetts Department of Public Health, Bureau of Environmental Health.

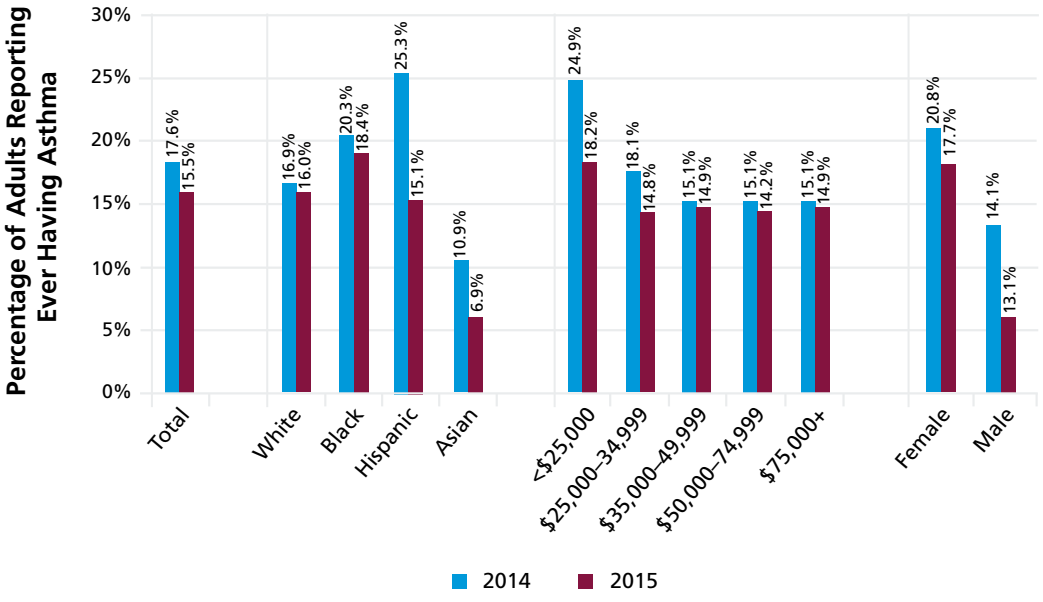
Asthma Prevalence Among Adults, 2004–2015



Source: U.S. Centers for Disease Control and Prevention and Massachusetts Department of Public Health, Behavioral Risk Surveillance System; U.S. data for 2015 not available.

- Asthma prevalence among adults in Massachusetts also increased through 2014 but then declined in 2015. The asthma rate in Massachusetts is higher than the median rate among all states.

Disparities in Asthma Prevalence Among Massachusetts Adults, 2014 and 2015



Source: Massachusetts Department of Public Health, *BRFSS 2014 and 2015.*

- Asthma rates among adults in Massachusetts declined from 2014 to 2015.
- Certain groups are more likely to have asthma than others.
  - African Americans had the highest rate of asthma in 2015 among racial and ethnic categories, and Asians the lowest.
  - The 15.1% rate for Hispanics in 2015 may be a survey anomaly; prevalence rates for this group in 2012 and 2013 (not shown) were about 20%.
  - Adults in households with income less than $25,000 per year are more likely to have asthma than higher income adults. The rates for people with incomes $35,000 and above were similar to one another in 2014 and 2015.
  - Women are more likely than men to have asthma. The gap shrank somewhat from 2014 to 2015 but considerable disparity remains.

Summary

Asthma is a common chronic disease among adults and children and imposes significant costs, both financial and in terms of health and well-being. There are disparities in the prevalence of asthma across racial and ethnic categories, income groups, gender, and cities and towns across Massachusetts. The most recent data from the Department of Public Health suggest that some disparities may be shrinking, but this one year change may be an artifact of the survey sample. This bears watching over the next several years.

Policy Perspective

The Massachusetts State Strategic Plan for Asthma 2015–2020, developed by the Massachusetts Department of Public Health and the Massachusetts Asthma Action Partnership (MAAP), is now almost two years into its implementation. The plan includes goals for strengthening the surveillance of asthma; reducing the disparities in asthma attacks, hospitalizations, and other outcomes; improving asthma management so that people with asthma live healthier lives; reducing exposure to environmental triggers that contribute to asthma; and strengthening the partnerships needed for a comprehensive approach.

The plan also sets a goal unique among state plans across the country: to accelerate attention to primary prevention, meaning preventing healthy people from developing the disease in the first place. This is quite an extraordinary commitment because the "conventional wisdom" in public health is that we don't yet know enough about what causes asthma. The primary prevention goal and the roadmap developed to achieve it reflects consensus among Massachusetts researchers and other asthma leaders that while there remain gaps in understanding about effective interventions, and robust research is an ongoing need, significant changes to policy and practice aimed at reducing modifiable risk factors can proceed now, and evaluation of their impact can contribute to the base of evidence about how best to reduce the incidence of a complex chronic disease.

The MAAP has established a task force to prioritize among the 70 actions identified in the roadmap that target change at multiple levels — individual, institutional, and sectoral — and to coordinate implementation among over 50 organizations that have signed on. Two lessons from the work of the task force this year are worth sharing. The first is that if the Massachusetts primary prevention roadmap is extraordinary, it is also ordinary. Many of the risk factors that are implicated in the initial development of asthma are the same risk factors that trigger asthma attacks, so programs that help people with asthma are also likely to prevent asthma in healthy populations, especially those at higher risk. For example, programs to reduce the use of chemicals associated with asthma in homes and workplaces will help residents and workers who already have the disease and those who don't. Nutrition and exercise programs to reduce obesity in mothers and children will reduce asthma attacks and may prevent new cases of asthma. For these risk factors, the evidence base on effective interventions to prevent asthma could expand quickly simply by evaluating impacts on asthma onset of existing programs. The second lesson is that it is important to sustain capacity for ongoing assessment of relevant science and engagement of researchers and stakeholders. Just as geographic maps need to be updated as the landscape and infrastructure changes, the primary prevention roadmap will need to change to reflect evolving science. The rich discussion occurring now among scientists and clinicians as we develop a brochure with recommendations for the general public on the primary prevention of asthma (in particular, what can be said about exposure to household allergens) is an example of this.

The Commonwealth's leadership in developing and implementing effective programs to manage asthma in people with the disease, spanning two decades, is recognized around the United States. Massachusetts asthma leaders are equally proud of this new pioneering initiative to accelerate attention to the primary prevention of asthma. We look forward to engaging with scientists and stakeholders focused on asthma and with people exploring the challenges and opportunities of primary prevention of chronic disease more broadly, in the context of skyrocketing health care costs.

Polly Hoppin, ScD
Chair, Primary Prevention Task Force, Massachusetts Asthma Action Partnership
Research Professor and Program Director, College of Health Sciences/Lowell Center for Sustainable Production, University of Massachusetts, Lowell

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3.2 Obesity

Overview

Obesity and overweight are important health conditions that often contribute to poor health outcomes in adults and children. Obesity and overweight are measured using the body mass index (BMI).[42] An adult BMI number greater than 25 is considered overweight, and a BMI greater than 30 is considered obese. A child or teen is considered to be overweight when BMI is between the 85th and 94th percentile for their sex and age, and obese if BMI is the 95th percentile or greater.[43] BMI appears to be strongly correlated with various adverse health outcomes.[44] Although researchers have suggested different "normal" BMI standards for different ethnicities in recent years, [45] most medical professionals agree that a higher BMI increases the chance of serious diseases and conditions, including coronary heart disease, stroke, Type 2 diabetes, metabolic syndrome, various forms of cancer, and osteoarthritis.[46] By addressing obesity and overweight, children, teens, and adults can avoid adverse health outcomes. Obesity and overweight not only affect health outcomes, but also the costs of medical services.

Obesity is associated with (though not necessarily caused by) food insecurity. Factors affecting food-insecure people that may promote obesity include limited resources; lack of access to healthy, affordable foods; cycles of food deprivation and overeating; high levels of stress, anxiety, and depression; fewer opportunities for physical activity; greater exposure to marketing of obesity-promoting products; and limited access to health care.[47]

Massachusetts has lower overweight and obesity rates than national averages, but overweight and obesity are still important issues for certain parts of the population. About 6 in 10 Massachusetts adults are overweight and one-quarter are obese.[48] Men, male students (especially Black and Latinx students), baby boomers, low-income earners, and people with disabilities, in particular, had high rates of overweight and obesity in 2015.

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[42]BMI is calculated as the ratio of weight to the square of height.
[43]Centers for Disease Control and Prevention. *Defining childhood obesity*. www.cdc.gov/obesity/childhood/defining.html. Accessed November 12, 2016.
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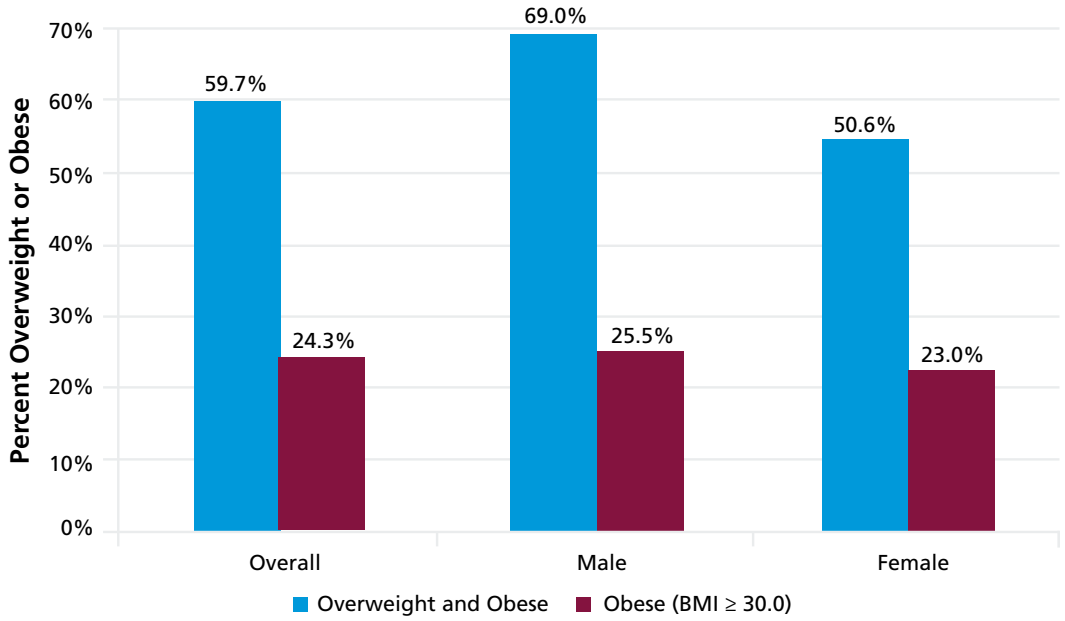
Trends

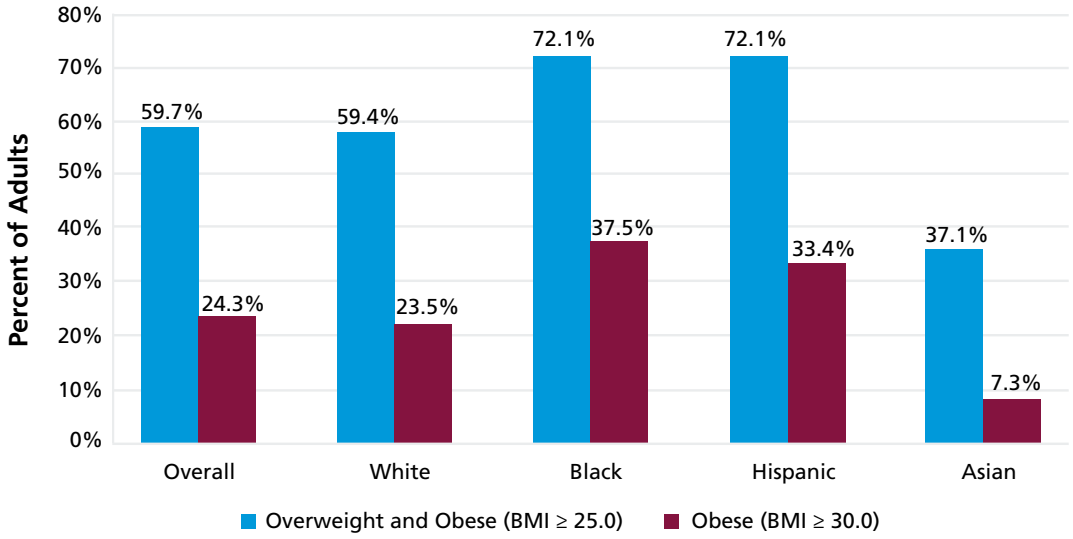
Obese and Overweight Adults in Massachusetts by Gender, 2015



Source: MA Department of Public Health, Office of Data Management and Outcome Assessment, A Profile of Health among Massachusetts Adults, 2015: Massachusetts Department of Public Health, *Behavioral Risk Factor Survey*.

- In 2015, 6 in 10 adults (59.7%) in Massachusetts were overweight or obese; one-quarter (24.3%) were obese. These figures are 5 to 6 percentage points lower than national medians.[49]
- Men are more likely to be overweight than women; 7 men in 10 are overweight or obese, compared with about half of women. Men's and women's obesity rates are much more comparable.

Obese and Overweight Adults in Massachusetts by Race/Ethnicity, 2015

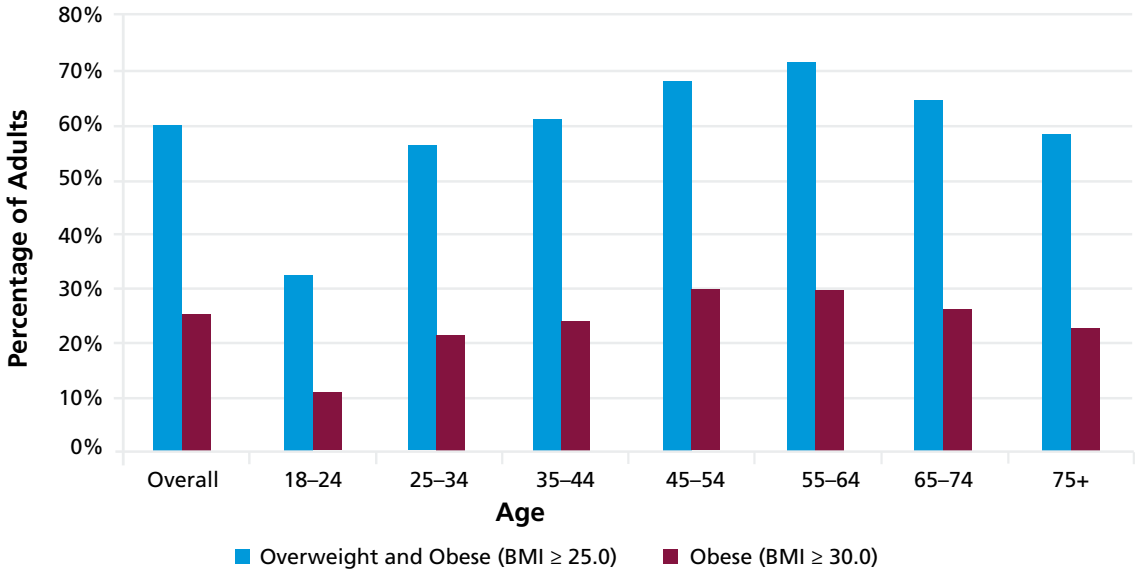


Source: U.S. Census Bureau, *2010–2014 American Community Survey 5-Year Estimates*.

[49]Massachusetts Department of Public Health, Office of Data Management and Outcomes Assessment. *A profile of health among Massachusetts adults, 2015: Results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2015.pdf. 2015: 58. Accessed November 2, 2016.

- Black and Hispanic adults were most likely to be overweight and obese in 2015. Nearly three-quarters (72.1%) of Black adults had a BMI greater than 25, and three-eighths (37.5%) had a BMI greater than 30. Seven in 10 (69.3%) Hispanic adults were overweight or obese, and one-third (33.4%) were obese.

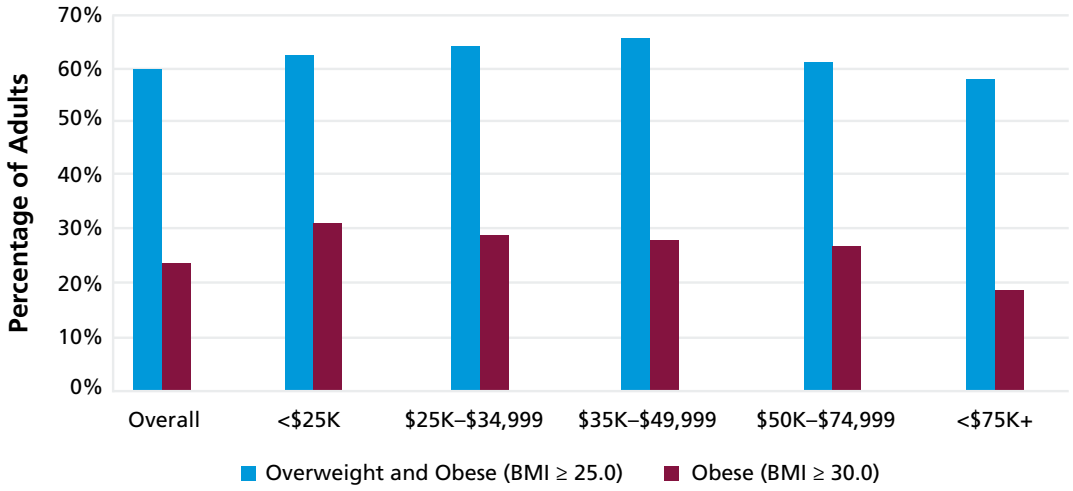
Obese and Overweight Adults in Massachusetts by Age, 2015



Source: Massachusetts Department of Public Health, Office of Data Management and Outcome Assessment, *A Profile of Health among Massachusetts Adults, 2015*.

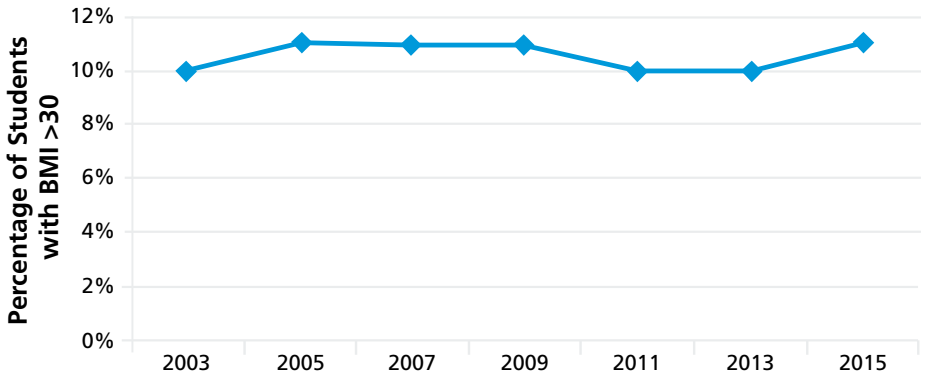
- Older adults, especially those between 45 and 64 years old have relatively high rates of obesity and overweight. More than 7 in 10 (71%) of adults between 55 and 64 years of age had a BMI greater than or equal to 25. About 3 in 10 adults between 45 and 64 were obese.

Obese and Overweight Adults in Massachusetts by Race/Ethnicity, 2015



Source: MA Department of Public Health, Office of Data Management and Outcome Assessment, *A Profile of Health among Massachusetts Adults, 2015*.

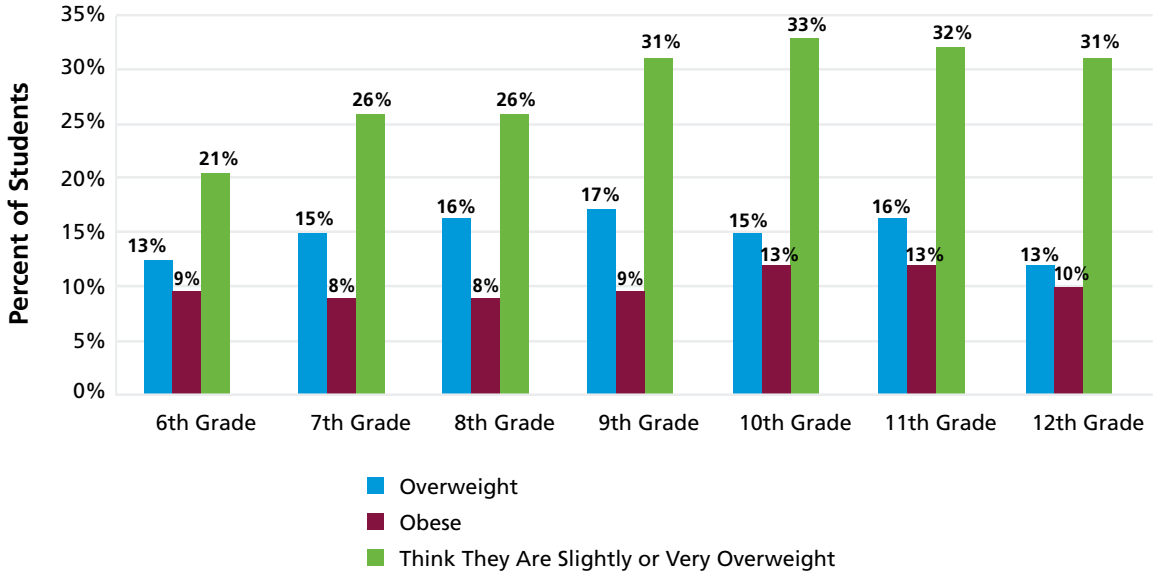
Obese High School Students in Massachusetts, 2003–2015



Source: U.S. Centers for Disease Control and Prevention, *Youth Risk Behavior Surveillance System, 2003–2015.*

- Obesity and overweight vary by income. Differences in overweight and obesity rates are most pronounced between adults with incomes below and above $75,000 per year.

Obese and Overweight Students in Massachusetts, by Measure and Perception, 2015



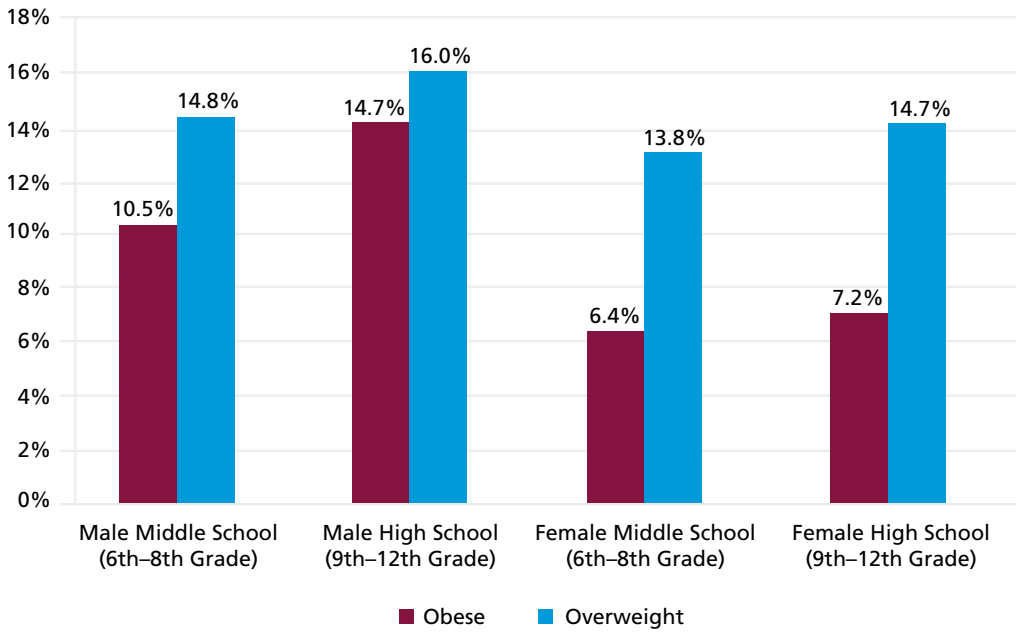
Source: Massachusetts Department of Public Health and Massachusetts Department of Elementary and Secondary Education, *2015 Report: Health and Risk Behaviors of Massachusetts Youth, Executive Summary*.

- Massachusetts' high school student obesity rate has remained relatively steady over the past 12 years, generally fluctuating between 10% and 11% annually. The 2015 rate of 11% is 2.9 percentage points lower than the national average for the same year.[50]

[50]Centers for Disease Control and Prevention. *Trends in the prevalence of obesity, dietary behaviors, and weight control practices: National YRBS: 1991–2015*. www.cdc.gov/healthyyouth/data/yrbs/pdf/trends/2015_us_obesity_trend_yrbs.pdf.

- Massachusetts student overweight and obesity rates vary by grade. Ninth grade students had the highest rate of overweight in 2015 (16.8%). Measured obesity is higher among 10th and 11th grade students.
- Student perception about their weight does not reflect actual measurement and varies by grade. All students are more likely to think they are overweight than actually are, by considerable margins. Over 30% of high school students think they are overweight, about double the actual rate.

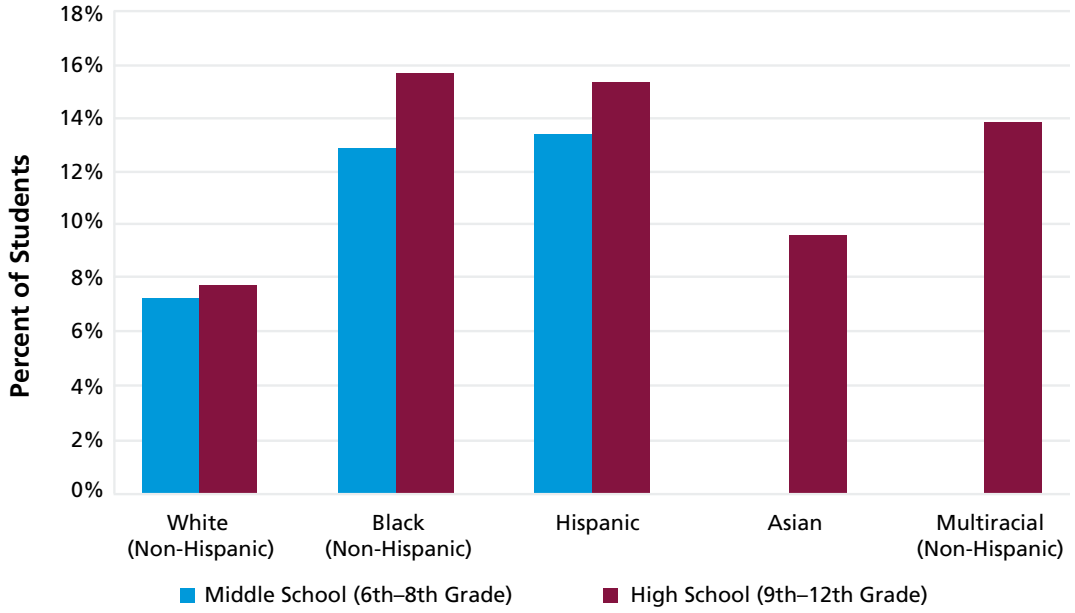
Obese Middle and High School Students in Massachusetts by Gender, 2015



Data Source: Massachusetts Department of Public Health and Massachusetts Department of Elementary and Secondary Education, *2015 Report: Health and Risk Behaviors of Massachusetts Youth, Executive Summary.*

- Obesity and overweight among Massachusetts middle and high school students varies by gender. Boys in middle and high school are more likely than girls to be overweight and obese. Rates of overweight are similar between boys and girls (though boys are higher) but rates of obesity differ substantially.

Obese Middle and High School Students in Massachusetts by Race/Ethnicity, 2015



Note: Data is not available for Asian and multiracial middle school sudents.

Source: Massachusetts Department of Public Health and Massachusetts Department of Elementary and Secondary Education, *2015 Report: Health and Risk Behaviors of Massachusetts Youth, Executive Summary.*

- Black and Hispanic students have the highest rates of obesity in middle and high school.

Summary

Overweight and obesity rates vary across Massachusetts children, teens, and adults. Male middle school and high school students (especially Black and Hispanic students) were most likely to have higher BMI compared to other students in 2015. Men and Black and Hispanic adults had higher rates of overweight and obesity compared to other adult groups. Low income people and adults with a disability are also more likely to be overweight or obese.

Policy Perspective

Lifestyle-related chronic diseases account for 75% of U.S. health care expenses with overweight/obesity contributing as much as 10%.[51] Keeping obesity rates at the 2010 level for the next several decades would save more than $500 billion.[52] There is increasing evidence that poor lifestyles are associated with recent immigration and poverty rather than race and ethnicity. The eighth edition of this report documented a decline in the rate of obesity in low-income children between 2 and 4 years of age while rates of obesity in school-aged children (6th to 12th grade) and adults remained stable. The current report provides further evidence that since 2011, rates of obesity in adolescents (10.9% [2010]; 11% [2015]) and adults (23% [2010]; 24.3% [2015]) are fairly stable.[53]

Massachusetts has adopted public policies such as nutritional standards for competitive foods, water availability in schools, farm-to-school programs, and use of SNAP benefits at farmer's

[51]Finkelstein EA et al. Obesity and severe obesity forecasts through 2030. *Am J Prev Med*. 2012; 42(6): 563–570.
[52]Finkelstein EA et al. Obesity and severe obesity forecasts through 2030. *Am J Prev Med*. 2012; 42(6): 563–570.
[53]Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System: Prevalence and trend data — overweight and obesity, U.S. obesity trends, trends by state 2010.* http://www.cdc.gov/brfss/index.html.

markets. Building on our 2014 perspective and evidenced-based data, we recommend the expansion of successful programs such as Build Our Kids' Success, a before-school exercise program,[54] to all schools, and the implementation of a sugar-sweetened beverage tax alongside a subsidy for healthy foods.[55] To improve the care of low-income obese patients, we recommend Massachusetts legislators enact legislation similar to the Treat and Reduce Obesity Act (H.R. 2404), proposed in the U.S. House of Representatives, which will reimburse allied health professionals providing clinical weight loss services.[56] We also support the National Diabetes Prevention Program offered at YMCAs and elsewhere, which will be eligible for Medicare coverage of adults.

In order to achieve these recommendations, Massachusetts state legislators need to continue to engage academicians and community members in supporting evidence-based initiatives and to support effective policies, including expanding food-related benefits such as WIC and SNAP that advance progress in decreasing obesity prevalence in adults and children in Massachusetts and the United States.

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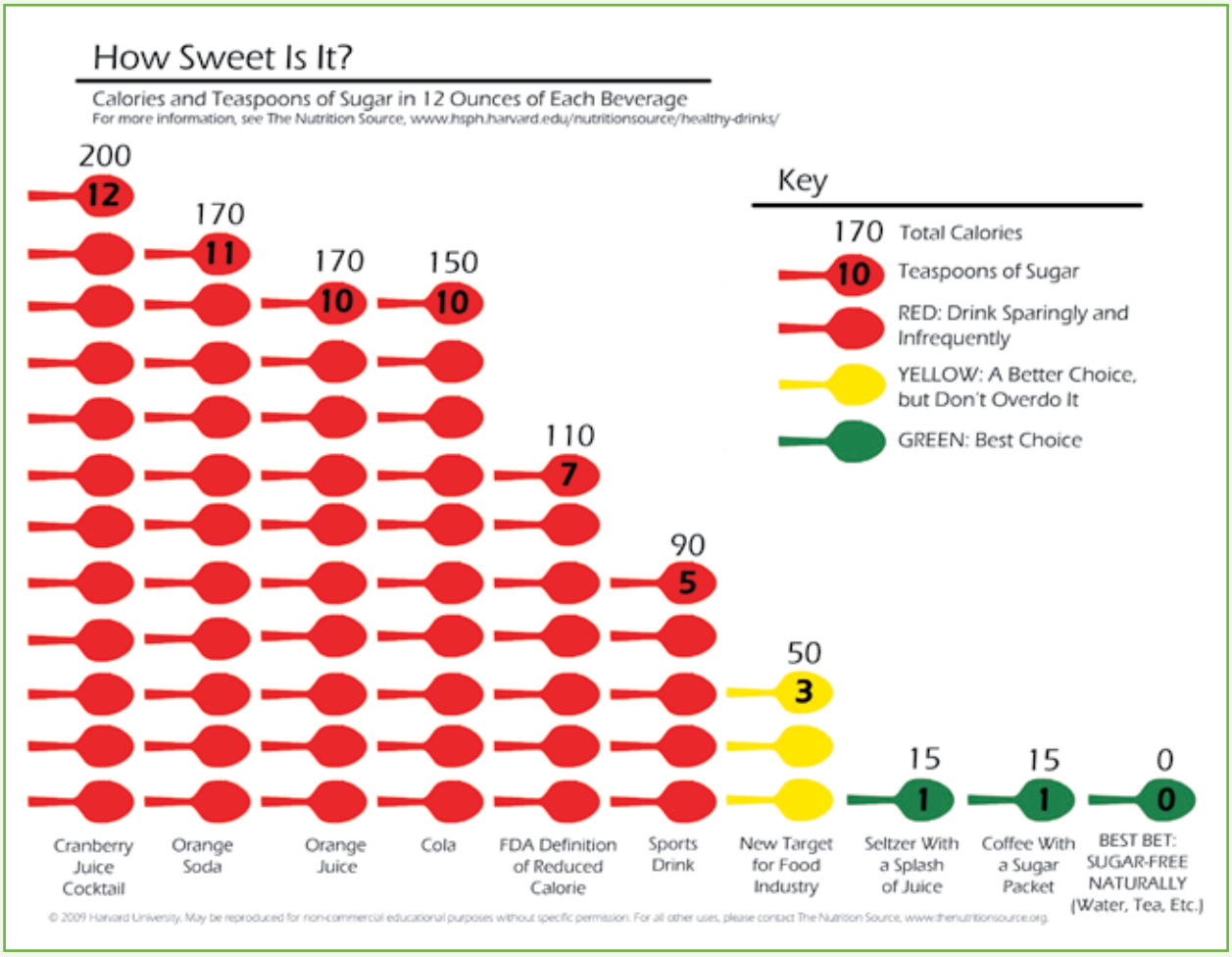
National Institute of Health, National Heart, Lung, and Blood Institute. *What are the health risks of overweight and obesity?* www.nhlbi.nih.gov/health/health-topics/topics/obe/risks. Accessed November 22, 2016.

[54]Westcott WL, Puhala K, Colligan A, Loud RL, Cobbett R. Physiological effects of the BOKS before-school physical activity program for preadolescent youth. *J Exerc Sports Orthop.* 2015; 2(2): 1–7.
[55]Fiscal policies for diet and prevention of noncommunicable diseases: Technical meeting report. Geneva: World Health Organization. May 2015. http://apps.who.int/iris/bitstream/10665/250131/1/9789241511247-eng.pdf?ua=1.
[56]Lenders CM, Manders AJ, Perdomo JE, et al. Addressing pediatric obesity in ambulatory care: Where are we and where are we going? *Curr Obes Rep.* 2016; 5(214). doi:10.1007/s13679-016-0210-2.

How Sweet is It? — The Amount of Sugar in Soda, Juice, Sports Drinks, and Energy Drinks

This graphic from the Nutrition Source and the Department of Nutrition at Harvard School of Public Health illustrates the high amounts of sugar in common beverages.



Note from the website (https://www.hsph.harvard.edu/nutritionsource/how-sweet-is-it):

Beverage manufacturers may have reformulated their products since we prepared this list in April 2009, or may have come out with new products. So use the beverage manufacturer's websites as the best source of information on drink nutrient content and new beverages.

3.3 HIV/AIDS

Overview

The Human Immunodeficiency Virus (HIV) weakens an infected person's immune system by destroying T cells that fight disease and infection. HIV is the virus that can lead to acquired immunodeficiency syndrome (AIDS) if not treated. There is no cure for HIV; once the body is infected, the virus stays in it for life. An estimated 1.2 million people in the United States are living with HIV. Due to improved treatments, the survival rate from HIV is much improved, and the annual number of new diagnoses declined by 19% from 2005 to 2014. However, HIV is still a serious health concern in the nation, with an estimated 44,073 people diagnosed with HIV in 2014, and nearly 7,000 people in the United States died from HIV and AIDS in 2013.[57]

While there is no cure or vaccine to prevent HIV, it can be controlled with antiretroviral therapy (ART). ART medications can dramatically prolong the lives and improve the health of many people infected with HIV. This treatment also greatly lowers their chance of infecting others. Before the introduction of ART in the mid-1990s, people with HIV could progress to AIDS in a few years. Today, someone diagnosed with HIV and treated before the disease is far advanced can live nearly as long as someone who does not have HIV.[58]

Most commonly, people get or transmit HIV through sexual behaviors and needle or syringe use, although it can also be spread from mother to child during pregnancy, birth, or breastfeeding, and can be spread by being stuck with an HIV-contaminated needle or other sharp object.[59] In addition to ART treatment, which lowers the risk of transmission, HIV can be prevented by behavioral changes such as abstinence, limiting the number of sexual partners, never sharing needles, and using condoms during sexual activity. In addition, newer regimens, such as pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP), can prevent the transmission of the HIV virus for those at risk.[60]

In Massachusetts, full health insurance coverage and public education campaigns have resulted in better outcomes for people with HIV than across the country. In 2014, based on laboratory blood samples of every person diagnosed with HIV since the start of the epidemic, Massachusetts found that almost two-thirds of people living with HIV have lab results that show the virus at very low levels in their blood.[61] This compares with a similar study nationally that showed, in 33 states and the District of Columbia, 54.7% had lab results that indicated the virus was suppressed through medication.[62] Since a low viral load also reduces risk of transmission, this effective treatment is lowering transmission of HIV in assachusetts: the rate of new HIV infections declined 47% between 2000 and 2014.[63]

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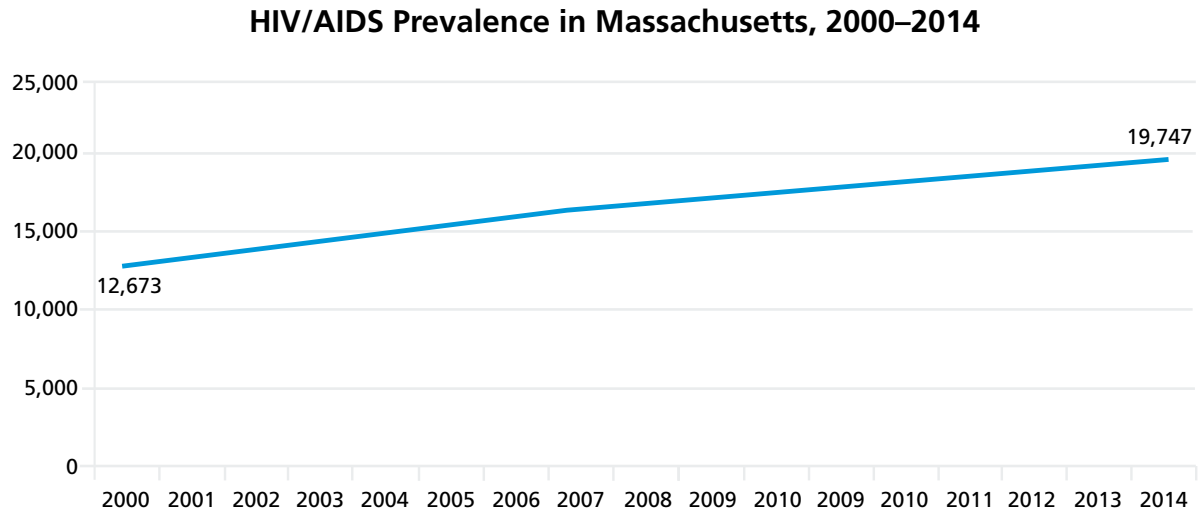
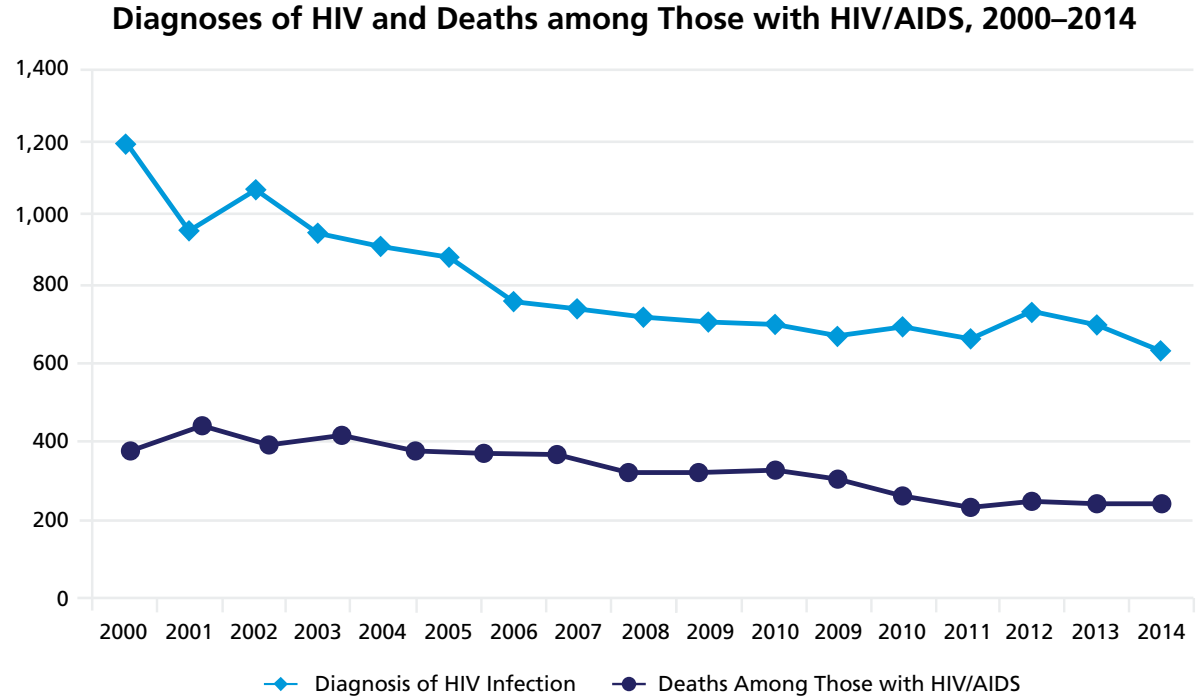
[57]Centers for Disease Control and Prevention. *HIV basics*. www.cdc.gov/hiv/basics/statistics.html.
[58]Centers for Disease Control and Prevention. *HIV basics*. www.cdc.gov/hiv/basics/whatishiv.html.
[59]Centers for Disease Control and Prevention. *HIV basics*. www.cdc.gov/hiv/basics/transmission.html.
[60]Centers for Disease Control and Prevention. *HIV basics*. www.cdc.gov/hiv/basics/prevention.html.
[61]Massachusetts Department of Public Health, *HIV Surveillance Program*. Massachusetts HIV Care Continuum. www.mass.gov/eohhs/docs/dph/aids/2016-profiles/hiv-care-continuum-factsheet.pdf. Published March 1, 2016.
[62]Centers for Disease Control and Prevention. *Selected national HIV prevention and care outcomes in the United States, July 2016*. www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-national-hiv-care-outcomes.pdf.
[63]Freyer FJ. State's step to control HIV seen as model for nation. *The Boston Globe*. www.bostonglobe.com. Published January 15, 2015.

Trends



Data Source: Massachusetts Department of Public Health, HIV/AIDS Surveillance Program, Data as of 3/1/16.

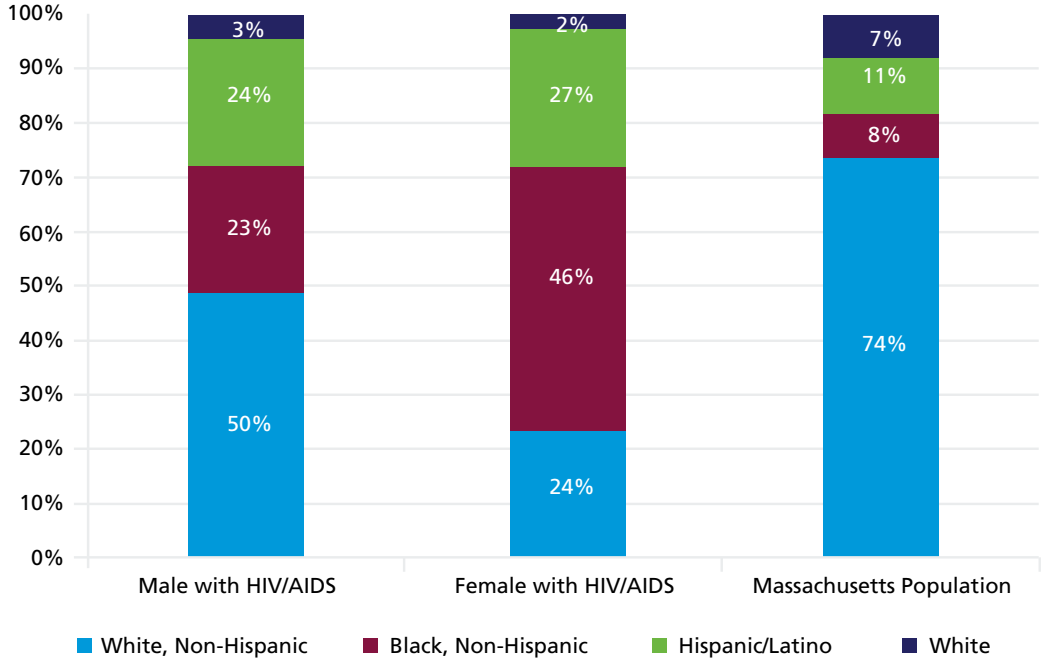
- Due to improved survival rates along with ongoing new infections, the number of persons living with HIV/AIDS in Massachusetts increased 56% between 2000 and 2014 to nearly 20,000 HIV-positive state residents.



Data Source: Massachusetts Department of Public Health, HIV/AIDS Surveillance Program, Data as of 3/1/16.

- New HIV diagnoses in Massachusetts decreased 47% from 2000 to 2014, and the number of deaths in HIV-positive persons decreased 35%.

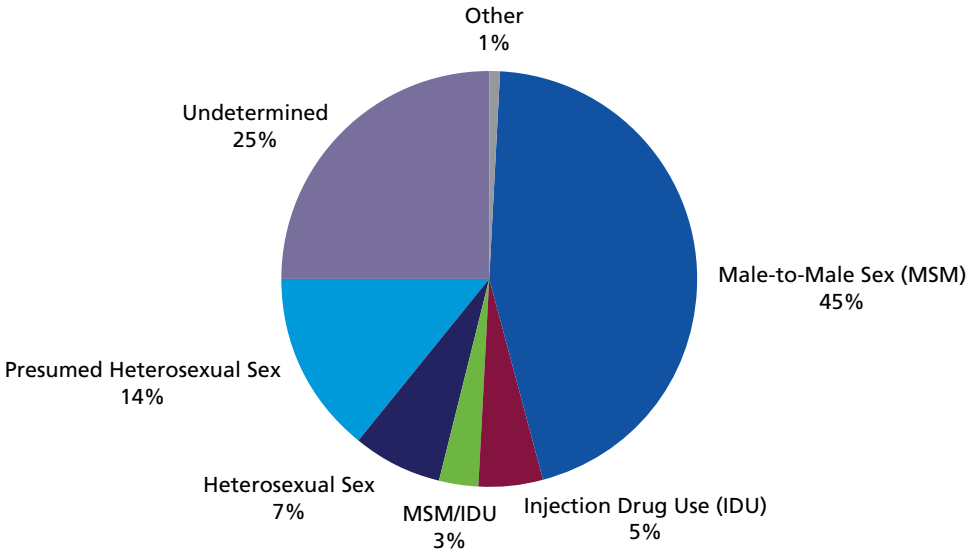
People Living with HIV Infection on December 31, 2015, by Sex at Birth and Race/Ethnicity Compared to Massachusetts Population



Data Source: Massachusetts Department of Public Health HIV/AIDS Surveillance Program, Data as of 3/1/16 and www.census.gov, *2015 Quick Facts*.

- Among men, White men represent 50% of those living with HIV/AIDS, but Black and Hispanic men have a higher incidence of HIV/AIDS than White men.
- Among women, Black (non-Hispanic) and Hispanic/Latina women are disproportionately affected by HIV/AIDS.
- Overall, 14,439 men are living with HIV/AIDS, while 5,833 women are living with HIV/AIDS; men represent 71% of people living with HIV/AIDS.

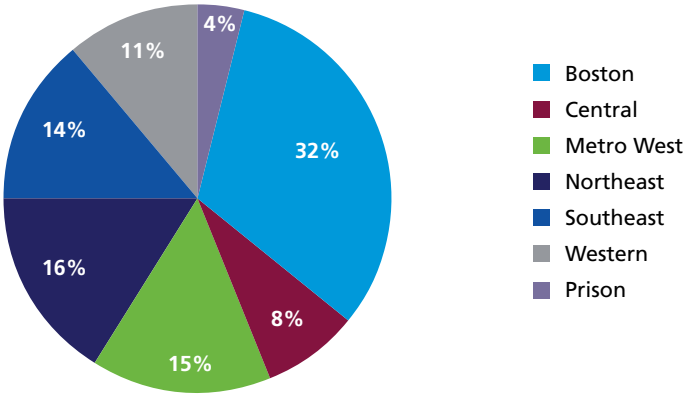
Percentage Distribution of People Diagnosed with HIV Infection within the Years of 2012–2014 by Exposure Method — Massachusetts



Data Source: Massachusetts Department of Public Health, *HIV/AIDS Surveillance Program*, Data as of 3/1/2016.

- Male-to-male sex and other sexual transmissions were the most frequently reported modes of new HIV infections between 2012 and 2014.
- Injection drug use alone accounted for only 5% of new diagnoses in 2012–2014, down from 7% in data reported for 2011–2013. By contrast, in 2005 injection drug use accounted for 15% of new diagnoses. The reduction of HIV infections through injection drug use occurring at the same time that injection drug use in general is increasing could be associated with multiple factors including public education on not sharing needles, or at least sterilizing needles with bleach if they are shared (which reduces but does not eliminate the risk of transmission).
- It is possible that increasing use of injection drugs will increase the rate of HIV infection in the future, but this is not yet seen in the data available through 2014.

People Living in Massachusetts with HIV/AIDS by Health Service Region: 2015*



Data Source: Massachusetts Department of Public Health, Bureau of Infectious Diseases, *HIV/AIDS Surveillance Program*.
*Data as of December 31, 2015.

- HIV/AIDS affects every geographic area of the state.
- 32% of the people in MA who are living with HIV/AIDS in 2015 live in Boston.
- It is notable that 4% of people living with HIV/AIDS were diagnosed while incarcerated.

Summary

The trends in both transmission and survival rates for people with HIV in Massachusetts have been very positive, although it remains a risk for young men who have sex with men, especially those who are Black non-Hispanic and Hispanic/Latino, and there is also an elevated risk for Black non-Hispanic women.

In the past, injection drug use was a leading risk for HIV infection, and while recent trends show that transmission from this method is falling, the opioid epidemic and increased rates of hepatitis C infections does indicate that HIV may again become a major risk to people who are injecting drugs. It is worth noting that bleaching and cleaning needles if they are shared reduces but does not eliminate the risk of HIV infection, but this is not effective against hepatitis C.

Policy Perspective

HIV continues to be a story of disparities. Racism, homophobia, transphobia, poverty, and HIV stigma continue to drive this epidemic. These social determinants deter some people from getting screened, and — for those living with HIV who know their status — create barriers to getting into care and achieving viral suppression. Economic barriers, particularly housing instability, and behavioral health needs are also key obstacles. And some populations continue to bear a greater burden of HIV. Men who have sex with men, particularly young Black and Latino gay men, and continue to see a disproportionate and heavy burden of new infections.

Last year, a statewide Massachusetts Getting to Zero Coalition was formed to look at the opportunity to achieve zero new infections, zero AIDS-related deaths, and zero HIV-related stigma. Throughout 2015, the coalition brought together stakeholders from diverse communities, including people living with HIV, those at highest risk, and the community-based and medical service providers serving them.

Unlike much of the country, Massachusetts has seen a significant decrease in new infections and death. Because of intentional policy decisions, specifically the expansion of insurance access to cover those living with HIV, and syringe access, we have seen improvements in health outcomes and HIV transmission unparalleled in much of the country.

Massachusetts has a unique opportunity to show the proof of concept that we can not only continue to make significant strides in decreasing overall infection numbers and increasing viral suppression rates, but also to focus in on those at greatest risk, specifically tackling the disparities that persist along the lines of race, sexual orientation, and gender identity. The Getting to Zero Coalition's blueprint, released on World AIDS Day on December 1, 2016, lays out a framework for what is working and what needs to be done differently to achieve the goals of getting to zero.

Carl Sciortino
Executive Director
AIDS Action Committee

SOURCES

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Massachusetts Department of Public Health, *HIV Surveillance Program. Massachusetts HIV care continuum, March 1, 2016*. www.mass.gov/eohhs/docs/dph/aids/2016-profiles/hiv-care-continuum-factsheet.pdf.

3.4 Hepatitis C

Overview

Hepatitis is an inflammation of the liver, a vital organ that filters the blood, processes nutrients, and fights infections. The liver's function can be affected when it is inflamed or damaged. There are several causes and types of hepatitis; hepatitis C is a liver infection that is caused by the hepatitis C virus. Acute hepatitis C is the first several months after someone is infected and can range from a very mild illness or no symptoms to a serious condition. Most people who are infected with hepatitis C develop a chronic lifelong infection, which over time can cause liver disease, liver failure, liver cancer, and other serious health problems. When symptoms appear with chronic hepatitis C, they are often a sign of advanced liver disease.

Hepatitis C is a blood-borne illness, and today the most common way the disease is spread is through sharing needles or syringes to inject drugs. Sexual transmission of hepatitis C is also possible. Hepatitis C can also be spread through getting tattoos or body piercings in informal settings with non-sterile instruments. Infants born to infected mothers are also at risk of getting hepatitis C.[64]

In the United States, it is estimated that there were 30,500 new cases of acute hepatitis C in 2014; between 2.7 and 3.9 million people have chronic hepatitis C.[65] People most at risk for hepatitis C infection include:

- Current or former injection drug users
- Recipients of blood transfusions or organ transplants before July 1992 or from a donor who tested hepatitis C positive
- Chronic hemodialysis patients
- Health care workers after needle sticks
- Children born to mothers with hepatitis C
- People with HIV

According to Centers for Disease Control and Prevention, approximately one-third of young injection drug users are infected with hepatitis C. The prevalence rates of hepatitis C among older injection drug users and former injection drug users is much higher, closer to 70–90%, reflecting both the higher rate of needle sharing in the 1970s and 1980s, before the risk of blood-borne infection was well known, and the increased risk from continued injection drug use over time.

The treatment for hepatitis C virus infection has evolved substantially since the introduction of highly effective hepatitis C virus protease inhibitor therapies in 2011. Since that time new drugs with different mechanisms of action have become available.

While these new medications now offer a cure for hepatitis C, many insurance companies declined to cover the medication for most people with hepatitis C due to the high cost of the medicine, which by list price ranges from $54,600 to $94,500 for a 12-week course of treatment. Many insurance companies would not cover the medication unless the patient had advanced liver disease and could show that they were no longer injection drug users.

These policies are changing now, at least for Medicaid members. In November 2015, the federal Centers for Medicare and Medicaid Services notified Medicaid directors that the law required Medicaid to cover the drugs.[66] In Massachusetts, MassHealth, the state Medicaid program, negotiated new discounts from manufacturers of these medications and as of August 1, 2016, directed their managed care organizations to lift the restrictions that had prevented many patients from getting the powerful drugs that can cure hepatitis C.[67]

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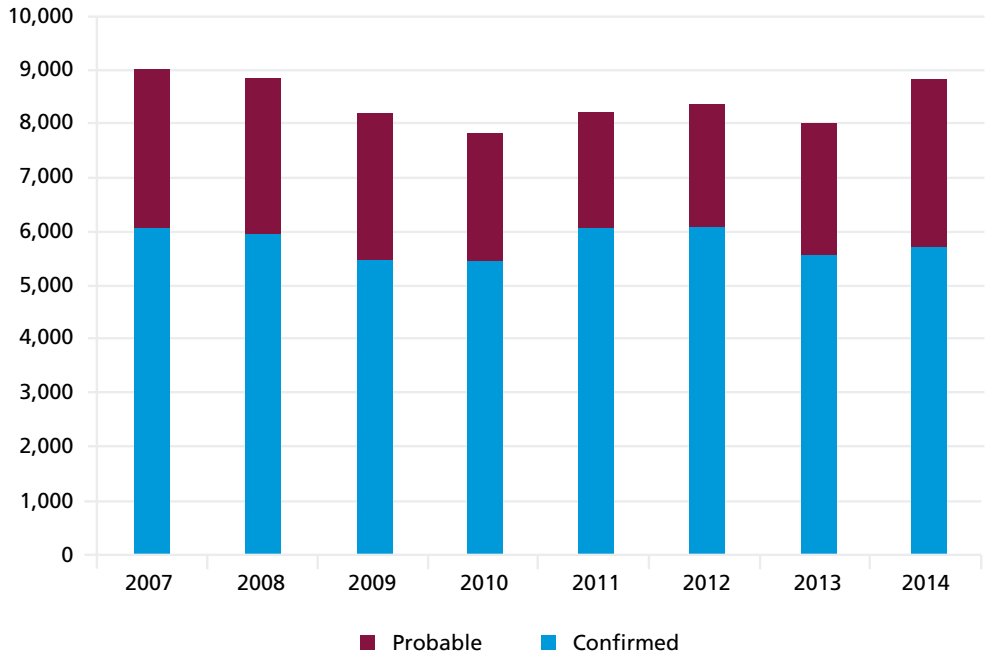
[64]Centers for Disease Control and Prevention. *Hepatitis C general information*. www.cdc.gov/hepatitis/hcv/pdfs/HepCGeneralFactSheet.pdf.
[65]www.cdc.gov/hepatitis/hcv/hcvfaq.htm.
[66]www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Prescription-Drugs/Downloads/Rx-Releases/State-Releases/state-rel-172.pdf.
[67]www.bostonglobe.com/metro/2016/06/30/masshealth-pay-for-hepatitis-drugs-for-all-infected-members/DhQNZCf9WDZH5CM41V4vgI/story.html.

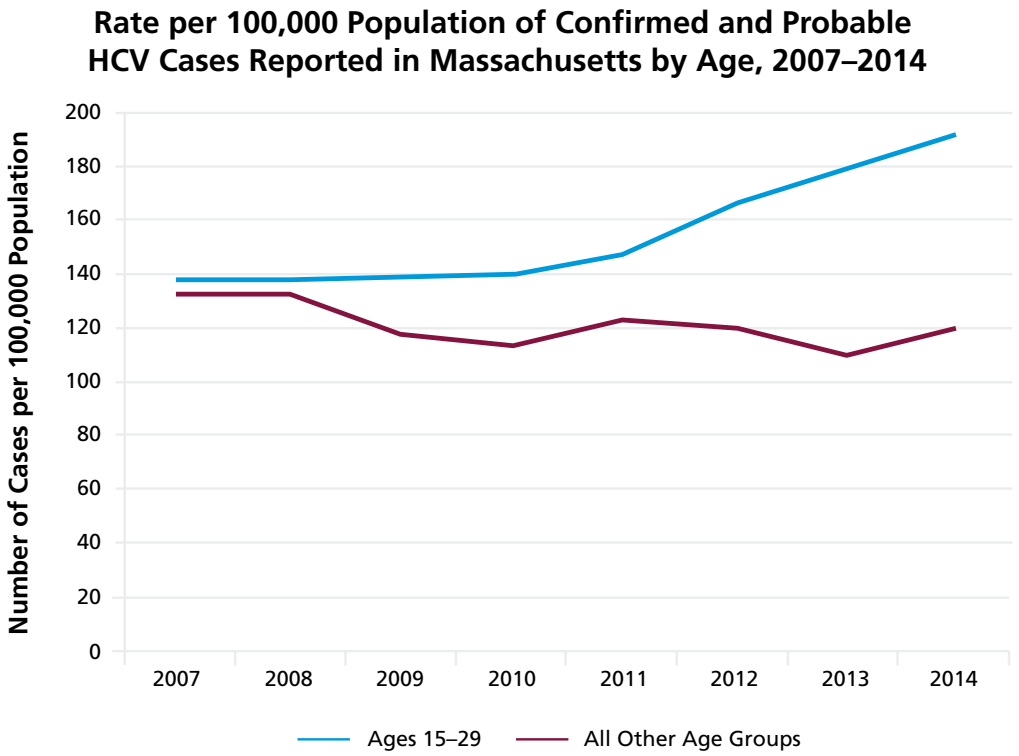
Trends

Number of Confirmed and Probable Past or Present and Acute HCV Cases Reported in Massachusetts, 2007–2014



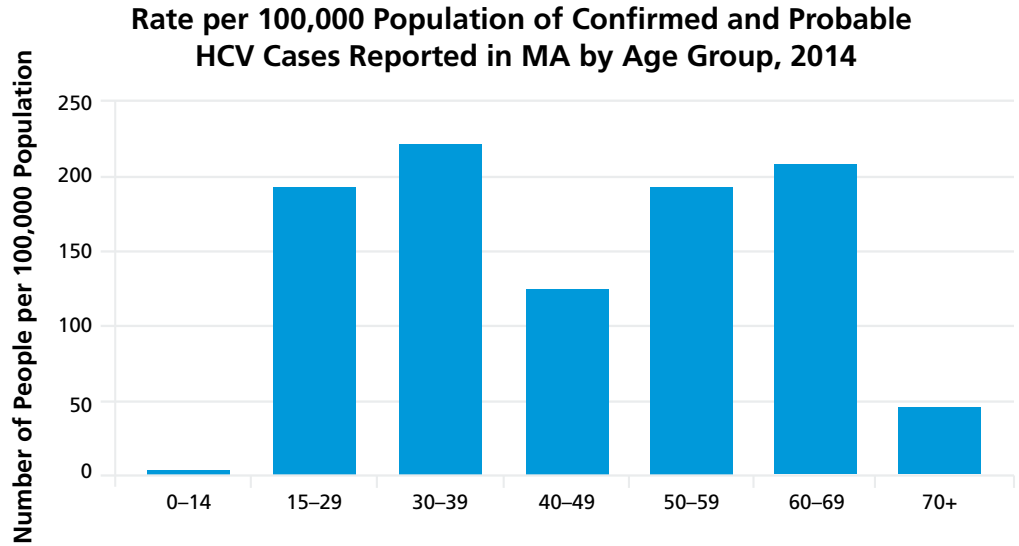
Data Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, *Hepatitis C Virus Infection 2015 Surveillance Report*.

- Hepatitis C is one of the highest-volume reportable diseases in Massachusetts, with 5,500 to 6,000 new confirmed cases reported in each year between 2007 and 2014. The number increases to between 8,000 and 9,000 cases if probable hepatitis C cases are included.
- Incidence of hepatitis is nearly the same as it was seven years ago. The rate of new reported cases seemed to be decreasing until 2010 but has increased more recently.



Data Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, *Hepatitis C Virus Infection 2015 Surveillance Report*.

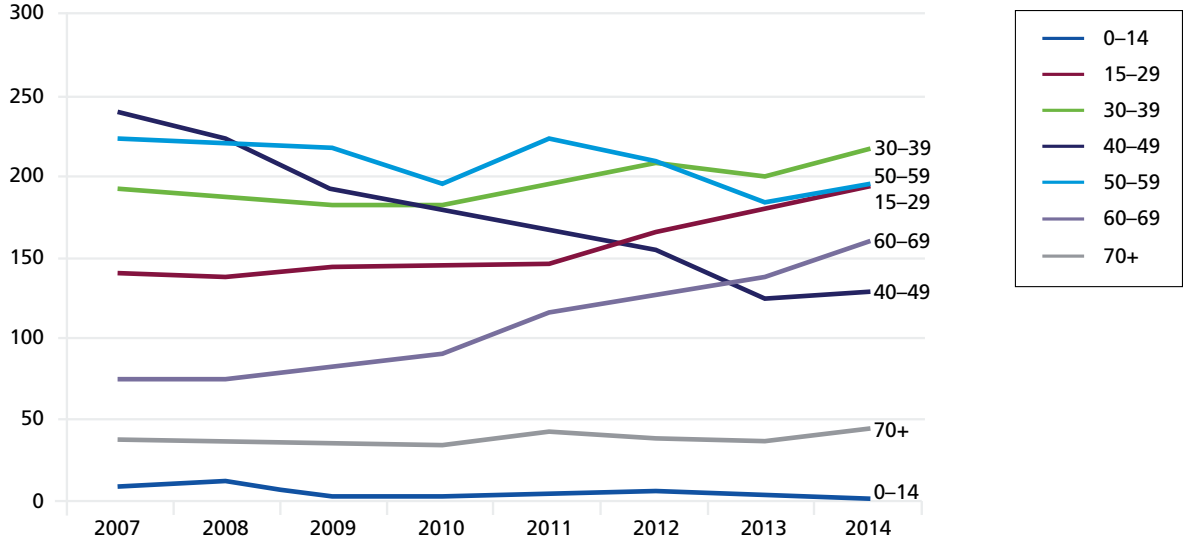
- The rate of hepatitis infection has particularly risen among 15- to 29-year-olds. All Other Age Groups shows some decrease, though this group's trend is influenced by the inclusion of children ages 0–14, who have very low rates of hepatitis C infection.
- Hepatitis C cases reported among adolescents and young adults is growing because of transmission among young people injecting drugs.



Data Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, *Hepatitis C Virus Infection 2015 Surveillance Report*.

- Looking at 2014 data, the highest rates of hepatitis C infection are among 30- to 39-year-olds, with both 15- to 29-year-olds and 50- to 59-year-olds also having high rates.

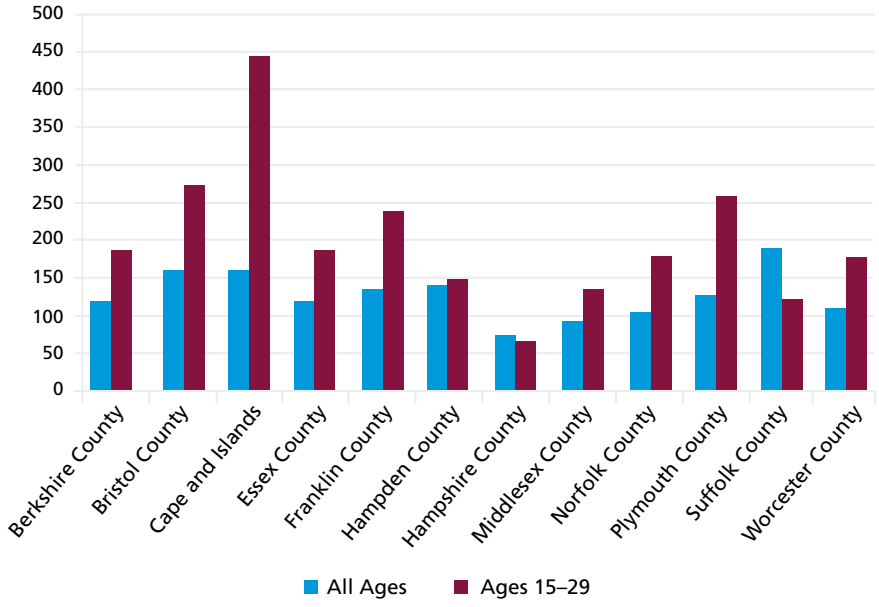
Rate per 100,000 Population of Confirmed and Probable HCV Cases Reported in Massachusetts by Age, 2007–2014



Data Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, *Hepatitis C Virus Infection 2015 Surveillance Report*.

- This chart of trends by age shows increasing rates of hepatitis C for teens and young adults and for older adults. As hepatitis C has been an incurable life-long disease until the advent of recent medications, it is not surprising that the rate of older adults with the disease is increasing, though the rates for middle-aged adults (40–59 years of age) have declined over this period.

Rate per 100,000 Population of Confirmed and Probable HCV Cases Reported in MA by County in 2014, for All Ages and 15–29-Year-Olds



Data Source: Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, *Hepatitis C Virus Infection 2015 Surveillance Report*.

- Suffolk County has the highest rate of hepatitis C among all age groups, but a lower rate among young people, indicating that those in Suffolk with hepatitis C are likely older people, who may have a different risk profile.
- The Cape and Islands have a strikingly high rate of hepatitis C infections among the young. Similarly, other southeast counties — Bristol and Plymouth — have higher rates among the young. In the western part of the state, Franklin County has higher rates, although not as high as the southeast.

Summary

Hepatitis C is a serious and chronic long term disease that has broad health impacts in Massachusetts, and it affects vulnerable populations already at risk for HIV and opioid drug overdose. The escalating rates of hepatitis C among young people and in the southeast area highlights one of the risks of the ongoing opioid drug epidemic.

At the same time, hepatitis C is now curable with an expensive medication. We should expect that with the greater use of this medication, the incidence of hepatitis C should be greatly reduced, although education regarding safe use of needles and addressing the epidemic of drug use generally will be important.

Policy Perspective

The last two years have seen hepatitis C virus (HCV) infection transformed from a complicated disease with toxic treatments to one that is straightforward enough to be managed by most primary care providers. At this point we have one-pill, once-a-day, well-tolerated regimens that cure over 95% of patients with any of the six major HCV genotypes in 12 weeks. Real-world registries also show cure rates of greater than 90%.[68] These advances have led the National Academies of Sciences to conclude that elimination of HCV in the United States is feasible, and this panel is currently analyzing how an elimination plan would be implemented.[69]

These lofty public health goals are still being held back by a major barrier — the prices of these regimens remain high enough to place a strain on cost-sensitive payers such as state Medicaid plans. Some of the key policy initiatives over the last two years have been in improving access to HCV treatment. The most important HCV policy document of this last year, "Assuring Medicaid Beneficiaries Access to Hepatitis C (HCV) Drugs," was released by the Center for Medicaid and Children's Health Insurance Program (CHIP) Services on November 5, 2015.[70] It reminded state fee-for-service and Medicaid managed care plans to comply with regulations that require states that provide coverage of prescription drugs (currently including all states) to provide coverage for all medically accepted indications, as described under the Food Drug and Cosmetic Act (FFDCA), including the new direct-acting antiviral (DAA) HCV drugs. Many state Medicaid programs have restricted access to HCV drugs to those patients who have advanced liver fibrosis and with a documented period of sobriety from illicit drugs and alcohol for 3 to 12 months.[71] Neither of these

[68]Tapper EB et al. *J Viral Hep.* Oct 11, 2016.
[69]www.nationalacademies.org/hmd/Activities/PublicHealth/NationalStrategyfortheEliminationofHepatitisBandC.aspx
[70]www.medicaid.gov/medicaid-chip-program-information/by-topics/prescription-drugs/downloads/rx-releases/state-releases/state-rel-172.pdf
[71]Barua S et al. *Ann Internal Med.* 2015; 163: 215–223.

restrictions are present in the FFDCA approved medical indications. Advocates in several states have used this document to encourage Medicaid programs to remove these illegal restrictions. In fact, all Medicaid plans in Massachusetts lifted all restrictions on access to DAAs on August 1, 2016.

Hepatitis C disproportionately affects vulnerable populations in the United States. We now have more tools to advocate for fair access to these curative regimens.

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SOURCES

Centers for Disease Control and Prevention. *Hepatitis C General Information*. Retrieved From www.cdc.gov/HEPATITIS/HCV/PDFs/HepCGeneralFactSheet.pdf.

Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences. *Hepatitis C Virus Infection 2015 Surveillance Report*. www.mass.gov/eohhs/gov/departments/dph/programs/id. Published March 2016. Accessed 11/22/16.

3.5 Injury Resulting from Violence

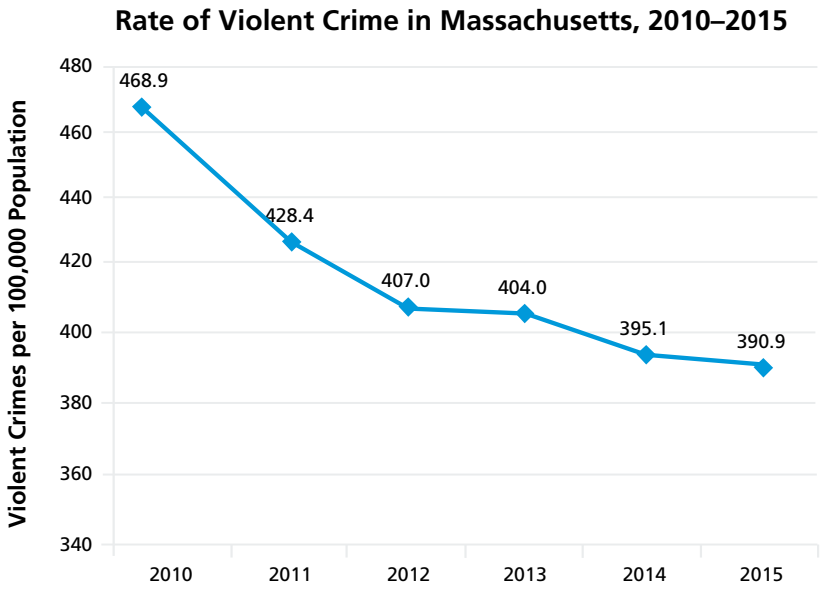
Overview

The connection of violence to health is, at one level, obvious. Homicide was the third-leading cause of death among 15- to 24-year-olds in Massachusetts in 2013, and the sixth-leading cause among 25- to 44-year-olds.[72] Homicide is the *number one* cause of death nationwide for Latinx and African American males between the ages of 15 and 24.[73] In a 2015 survey, nearly one-sixth of adult women and 5% of adult men said they had experienced sexual violence at some time in their lives.[74] These and other statistics make it clear that injury from violence is a health condition in and of itself, and that this condition is preventable supports its placement in this chapter.

Violence is also a risk factor for other illnesses. A growing body of research supports the notion that the stress response to exposure to violence as a child may cause physical alterations to the body that have lifelong effects on health. Childhood violence exposure is connected to abnormal immune system functioning and diseases related to chronic inflammation such as cardiovascular disease, type 2 diabetes, and dementia. Childhood violence victimization also is associated with psychiatric disorders, including anxiety, behavior, and substance use disorders, as well as schizophrenia, psychosis, and psychotic-like symptoms.[75] Clearly, the reduction of violence, particularly toward children, is a public health priority.

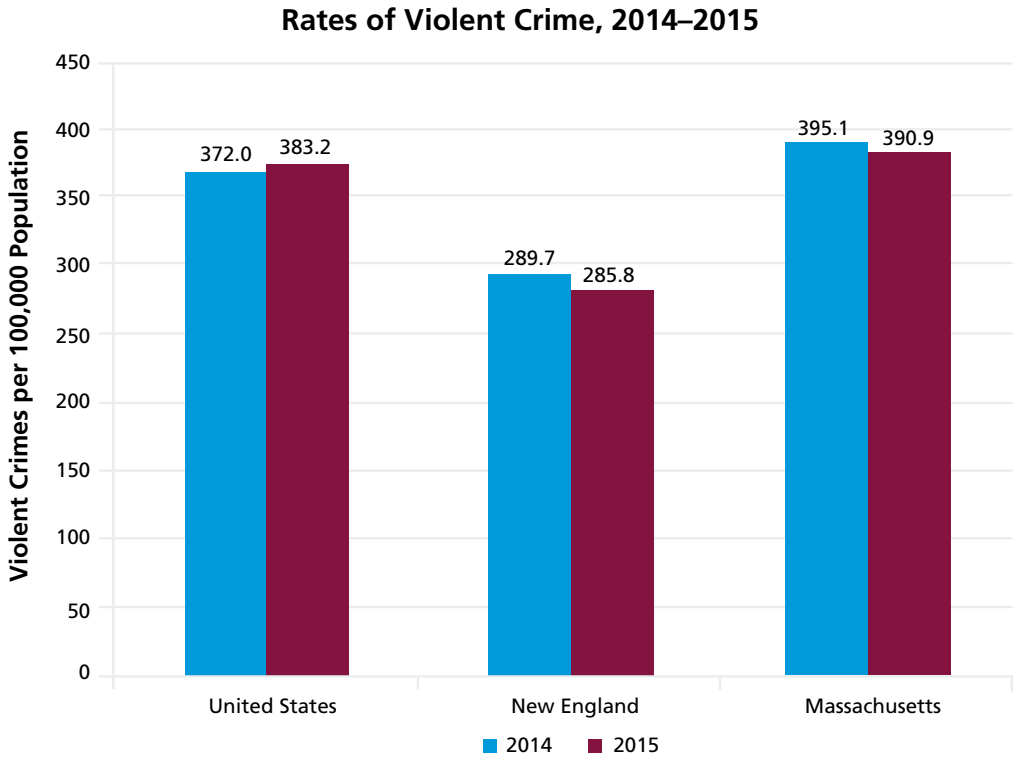
[72]Massachusetts Department of Public Health. *Massachusetts deaths 2013*.
[73]Cure Violence. *Violence as a health issue*. http://cureviolence.org/understand-violence/violence-as-a-health-issue. Accessed October 12, 2016.
[74]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults, 2015*.
[75]Moffitt TE. Childhood exposure to violence and lifelong health: Clinical intervention science and stress biology research join forces. *Dev Psychopathol*. November 2013; 25.

Trends



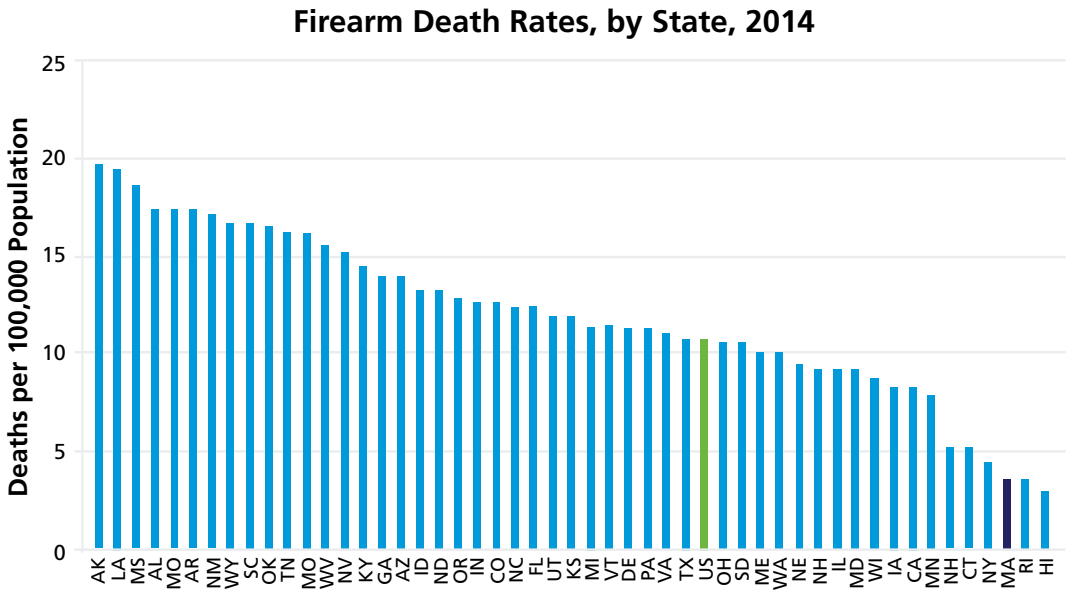
Source: FBI Uniform Crime Reports, 2010–2015.

- The rate of violent crimes in Massachusetts has declined over the last six years — rapidly at first, then more gradually since 2012.
- Violent crimes include murder and non-negligent manslaughter, rape, robbery, and aggravated assault.



Source: FBI Uniform Crime Reports, 2014 and 2015.

- Despite the decline, the violent crime rate in Massachusetts is still slightly higher than the national rate and considerably above the rate for all New England states.

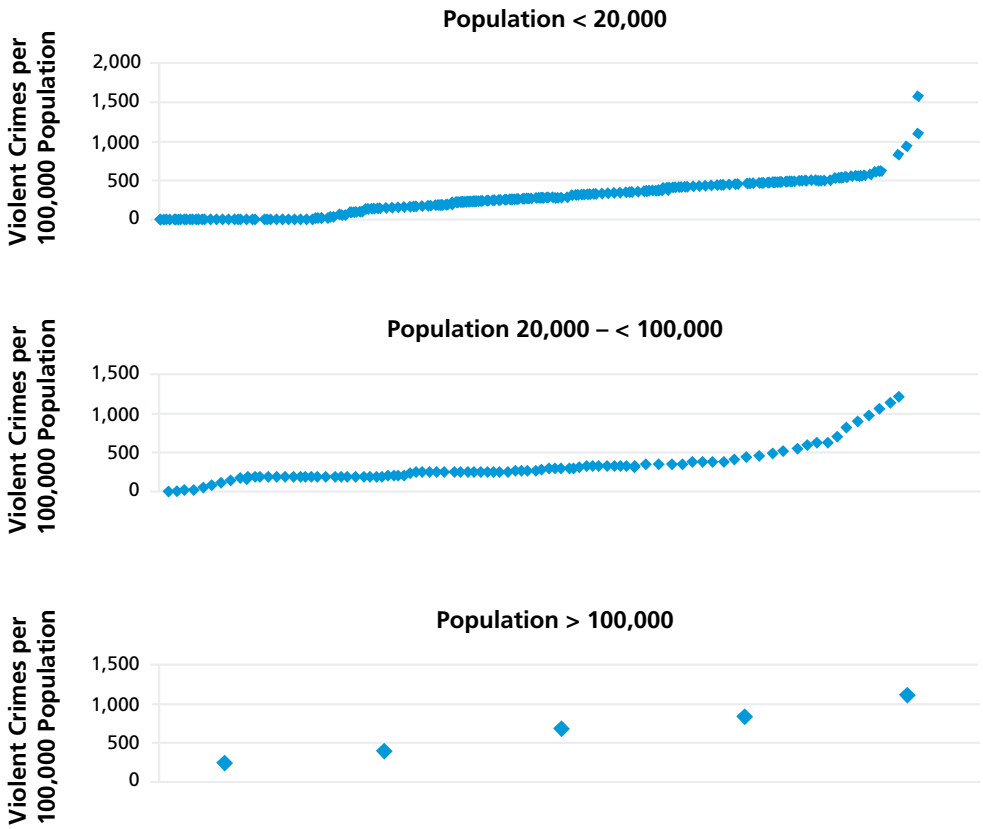


Source: Violence Policy Center, using data from the Centers for Disease Control and Prevention.

- The death rate from firearms, however, is quite low in Massachusetts compared with the national rate and most other states.[76]
- Massachusetts' rate of murder and non-negligent manslaughter is lower than the national rate (1.9 per 100,000 versus 4.9), as is its rate of robbery (77.8 versus 101.9), but its rate of aggravated assault is higher (280.7 versus 237.8) (data not shown). Rates of rape are comparable between Massachusetts and the country as a whole.

[76]Firearm death rates include suicides ("intentional self-harm" by firearm), which accounted for 130 of the 227 firearm deaths in Massachusetts in 2014. Centers for Disease Control and Prevention. National Center for Health Statistics. Underlying Cause of Death 1999–2015 on CDC WONDER Online Database, released December 2016. Data are from the Multiple Cause of Death Files, 1999–2015, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/ucd-icd10.html on January 4, 2017.

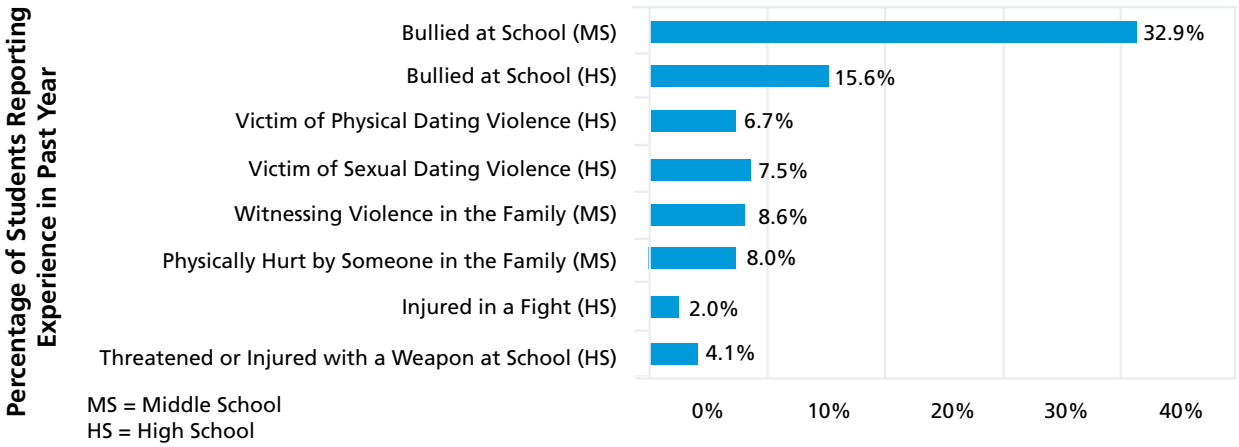
Rates of Violent Crime in Massachusetts Cities and Towns, by Size, 2015



Source: FBI Uniform Crime Reports

- The rates of violent crime vary widely across Massachusetts cities and towns. Variation occurs in large, midsize, and small municipalities.
- The 10 municipalities with the highest rates of violent crime and populations between 20,000 and 100,000 in 2015 were Fitchburg, Lawrence, Leominster, Yarmouth, Barnstable, Holyoke, Gardner, Brockton, Chelsea, and Fall River.
- For the largest cities, rates range from 295.6 per 100,000 (Cambridge) to 1,703.4 (Springfield). The Commonwealth's largest city, Boston, had a rate of 706.8 crimes per 100,000 in 2015, considerably above the statewide rate of 390.9.

Experiences with Violdence Among Massachusetts Middle and High School Students, 2015



Source: Massachusetts Dept. of Public Health, *Health and Risk Behaviors of Massachusetts Youth, 2015*.

- One-third of Massachusetts middle-school students and one-sixth of high school students reported having been bullied at school in the past year. Recent research has shown that bully victimization increases the risk of psychiatric problems.[77]
- A small but significant minority of middle and high school students have either been victims or witnesses to violence, both of which can have detrimental health effects.

Summary

Violence is an important public health concern. Though Massachusetts' violent crime rate has been falling in recent years, it is still above the national rate and considerably higher than other New England states. Firearm death rates and murder rates in Massachusetts are relatively low, and rates of aggravated assault are relatively high. As with any social phenomenon, violent crime rates vary widely *within* the state, across cities and towns of all sizes.

Special attention is due children, whose exposure to violence — as either victims or witnesses — can affect their lifelong well-being. Bully victimization is common, especially among middle school students, and other types of physical and sexual violence are also present, if less common.

[77]Moffitt.

Policy Perspective

There are four criteria we can use to determine if a social problem is a public health threat:

1. The problem must place a large burden on society.
2. Certain segments of the population should be more affected.
3. There should be research evidence suggesting effective prevention.
4. Prevention strategies should not yet have been fully implemented.

Do bullying and cyberbullying meet these four criteria? Let's look at each one.

1. Bullying is, without a doubt, a large burden upon society. It is associated with a myriad of emotional, mental health, academic, and social problems, as well as being associated with violence and substance misuse. Cyberbullying, a digital form of bullying, is associated with cyber harassment and digital sexual harassment, and some evidence suggests its mental health consequences are even more serious. Traditional bullying may actually be decreasing, but other forms appear to be increasing, most notably cyberbullying.
2. Females are more vulnerable to bullying than males; they are more likely to experience digital sexual harassment, bullying, and cyberbullying by friends (versus acquaintances). Children with special needs are also more likely to be bullied, and members of the LGBT community are much more likely to be targeted for bullying, cyberbullying, harassment, and even assault and violence.
3. Interestingly, despite decades of programming and research, the efficacy of bullying prevention programs remains somewhat controversial. Traditional programs focus on bullying in school, but we know that by adolescence most bullying gravitates back and forth between the Internet and school, and programming must reflect that reality. Some evaluations have shown only lackluster results, but certain program elements may be promising. For example, programming that emphasizes student initiative, responsibility and peer-to-peer helping appears to be particularly effective. Similarly, programming that emphasizes practical and concrete tips and approaches for educators can be very helpful.
4. The final step in addressing bullying and cyberbullying as public health problems is to improve broad and universal implementation of effective programming and to examine how successfully current policy and law can address these problems in schools. One example of the former that may be helpful is from the Massachusetts Aggression Reduction Center, in which public higher education utilizes faculty with relevant expertise and service-learning students to provide high-quality programming at no cost to local K–12 education (information can be found at www.MARCcenter.org). The Commonwealth of Massachusetts should also consider studying the 2010 Bullying Prevention Law's implementation in schools in a more systematic way.

Elizabeth K. Englander, PhD
Director, Massachusetts Aggression Reduction Center
Professor of Psychology, Bridgewater State University

Policy Perspective

Two years ago in this Policy Perspective space, I proposed three initiatives to reduce fears and increase hopes for Massachusetts youth: embedded trauma specialists in youth centers and schools in areas with the highest rates of violence would allow youth to develop trustful relationships with these specialists before trauma even occurs; adult bus monitors and audio/video surveillance would establish a safe passage from home to school and back home on bus routes with histories of violence and bullying; and remote kill switches for cellphones would discourage street robberies.

Since then, remote kill switches have, in fact, drastically reduced street robberies of cellphones. The other two proposals await action. Strained municipal budgets leave little room for new budget line items. Increases in personnel compensation and facility costs usually exceed increases in tax revenue. Philanthropic foundations and individuals seemingly could fund audio/video surveillance since it would be a onetime cost. Public health departments might be convinced it will be cost-effective in the long run to place embedded trauma specialists in schools and community youth centers.

For the ninth edition of this report, I offer three new suggestions, all of which, I believe, would ultimately be cost-effective:

Disaggregate Data for Better Focused Interventions

"Place-based" strategies are credited with reducing crime rates and gang-versus-gang violence in many cities throughout the state by concentrating our policing and violence prevention efforts in very small areas with hyper-rates of violent crime. We should also map areas of our state that have the lowest levels of academic achievement and acquisition of trade skills. Currently we follow large aggregated data sets by comparing racial groups, whole cities, states, and countries, but even zip codes are far too large to give us the data we need to effectively address these social determinants of human success or distress. Let's study the smallest geographic areas — census tracks. Using information available to the public, we can map poverty levels, violent crime, and school dropout rates. We can already identify the percentage of "First Generation Students" (i.e., youth from families where no one has graduated from a four-year college). We should develop a new metric, "First Generation Tradespeople" denoting the percentage of youth from families where no one has acquired a skilled trade. Such new maps would allow us to design community-specific interventions and public policies to effectively and efficiently address these challenges. Armed with this data, we could launch public-private partnerships that will not only help individuals but whole communities attain social and financial self-sufficiency.

Create Equitable, Universal After-School Programs

Our state has a great disparity between lower- and higher-income residents. We can create a statewide fund to provide safe, educational, exciting after-school activities for every child in the state regardless of place of residence. This would reduce the inequity that leaves many lower-income youth, who need these activities most, without them.

Foster Racial Unity

The Commonwealth needs government, charitable foundations, and generous individuals to support intentionally integrated sports, performing arts, and other high-interest youth activities. Youth who voluntarily participate in activities they love with others from diverse backgrounds report these experiences to be life-changing. They learn we can treat each other well and real friendships develop among the youths; also, they become protective and treat each other like family.

Emmett Folgert
Executive Director
Dorchester Youth Collaborative

SOURCES

U.S. Department of Justice, Federal Bureau of Investigation. *Crime in the United States* (uniform crime reports). https://ucr.fbi.gov/ucr-publications. Accessed October 27, 2016.

Violence Policy Center. *State firearm death rates*. www.vpc.org/fact-sheets/state-firearm-death-rates-ranked-by-rate-2014. Accessed October 12, 2016.

Massachusetts Department of Public Health. *Health and risk behaviors of Massachusetts youth, 2015*.

3.6 Substance Use — Opioids

Overview

Massachusetts, like the rest of the nation, is in the midst of an unprecedented opioid epidemic. In Massachusetts, more people died from opioid-related overdoses in 2015 than in any year on record. Since 2000, the number of opioid-related overdoses in Massachusetts, including both prescription opioids and heroin, has more than quadrupled. Nationally, over 165,000 people have died from prescription opioid-related overdoses since 1999. In 2014, the most recent year on record for national data, there was a sharp increase in heroin-involved deaths and an increase in deaths involving synthetic opioids such as fentanyl.[78]

These trends are mirrored in Massachusetts, which in 2015 continued to see an increase in heroin- and fentanyl-related overdose deaths.

Opioids are a class of drugs including the illegal drug heroin as well as powerful pain relievers available legally by prescription, such as oxycodone, hydrocodone, codeine, morphine, fentanyl, and others. These drugs interact with opioid receptors on nerve cells in the body and brain, and they relieve pain and produce euphoria. Opioid pain relievers are generally safe when taken for a short time and as prescribed by a doctor, but they are frequently misused. Opioids are highly addictive and even when prescribed by a doctor, regular use can promote dependence. When misused, opioid pain relievers can lead to fatal overdose. The current increase in the use of heroin has been linked to the epidemic of prescription opioid misuse.[79]

In the last two years, heroin available on the street has been found to be increasingly mixed with more powerful drugs such as fentanyl, leading to an increase in overdoses.

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[78]The Department of Health and Human Services. *The opioid epidemic: by the numbers*. www.hhs.gov/sites/default/files/Factsheet-opioids-061516.pdf. June 15, 2015.
[79]The National Institute on Drug Abuse. *Opioids*. www.drugabuse.gov/drugs-abuse/opioids.

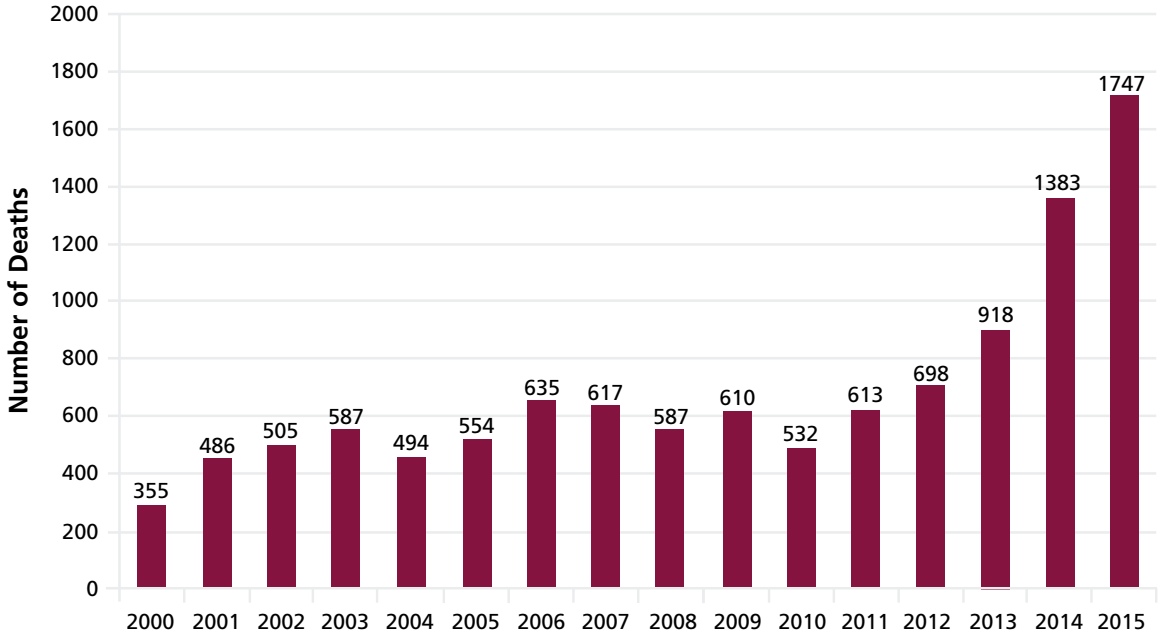
Drug use and drug overdose affects people across age groups, socioeconomic status, and education levels. Beyond the immediate risk of overdose, injection drug use is linked to HIV infection and hepatitis C. Many people with drug addiction also struggle with co-occurring mental disorders.

Responses to the opioid epidemic include addressing opioid prescribing practices through physician education, and new limits on the number of opioid medications that may be prescribed, as well as increasing the availability to first responders and caregivers of Naloxone (Narcan), the overdose reversal agent. The increased use of Naloxone improves the survival rate for those who overdose, so while the number of overdoses continues to grow, the proportion of overdoses that are fatal may be decreasing. This inference is suggested by the number of Emergency Medical Services transports increasing at a faster rate than the opioid-related death rate between 2013 and 2015.[80]

Massachusetts is also addressing the epidemic through increasing the number of treatment beds available and making Medication-Assisted Treatment more available. Massachusetts also is building a broader array of substance use disorder treatment services into the MassHealth program, through the SUD section of the federal 1115 Medicaid waiver. The waiver includes longer-term residential treatment, previously available through the Bureau of Substance Abuse Services, as a Medicaid-covered service.

Trends

Opioid-Related Deaths, Unintentional/Undetermined in Massachusetts 2000–2015

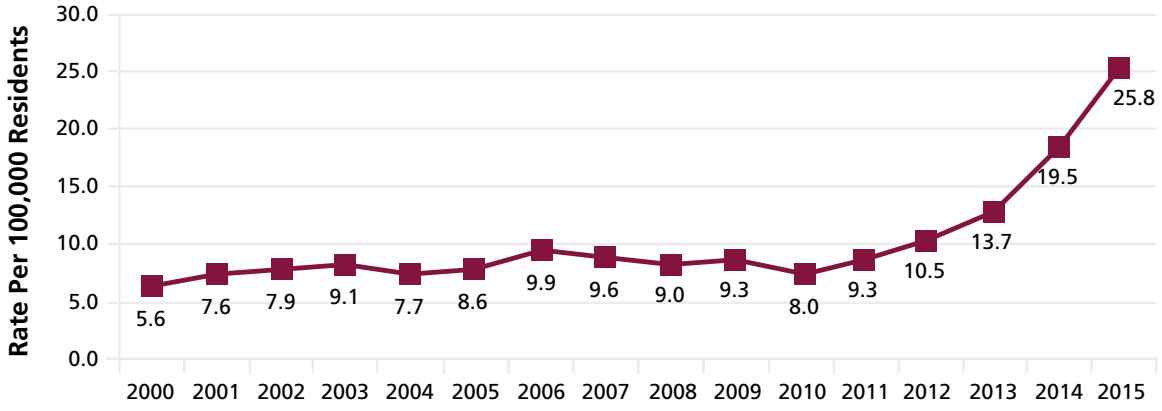


Data Source: Massachusetts Department of Public Health, *Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents*, Posted November 2016.

2014 and 2015 data include confirmed and estimated deaths.

[80]Massachusetts Department of Public Health. *Opioid-related EMS transports Massachusetts residents: 2013–2016.* November 2016.

Opioid-Related Deaths, Unintentional/Undetermined in Massachusetts 2000–2015



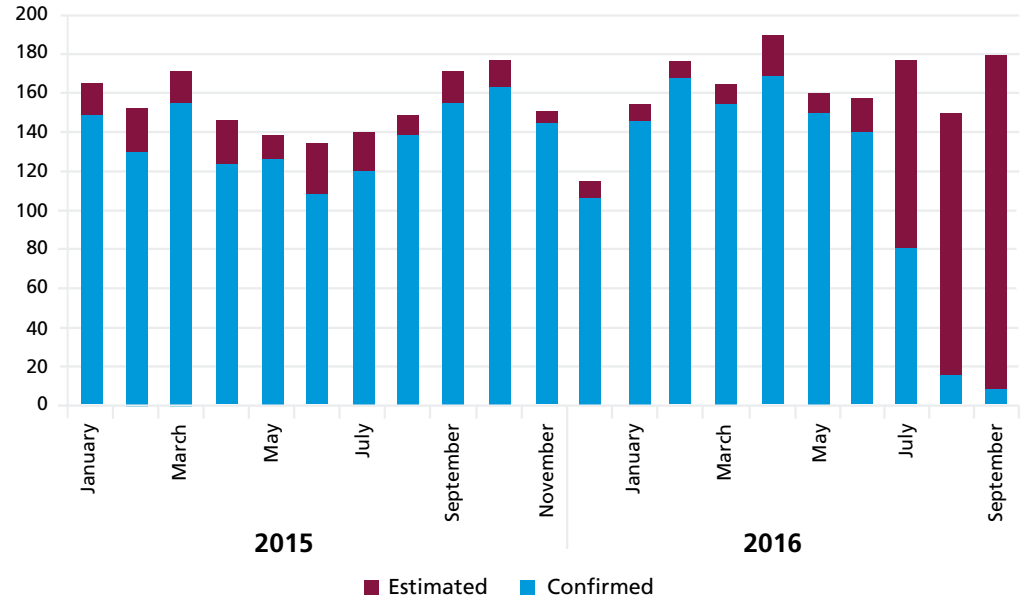
Data Source: Massachusetts Department of Public Health, *Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents*, Posted November 2016.

2014 and 2015 data include confirmed and estimated deaths.

- Deaths from opioid-related overdoses has skyrocketed in last two years, as shown both by the raw numbers of deaths and the rate per 100,000 residents. Opioids include heroin, Fentanyl, opioid-based prescription painkillers, and other unspecified opioids.
- Fentanyl, a powerful narcotic, is now frequently found in heroin available on the street and is contributing to the escalating number of deaths from overdose.
- First responders' use of Naloxone, also called Narcan, the opioid reversal agent, has increased in recent years, as the crisis has escalated. Data from the Massachusetts Ambulance Trip Reporting Information System (MATRIS) indicates that use of Naloxone in Emergency Medical Services (EMS) transport incidents increased from nearly 1,000 incidents in the first quarter of 2013 to nearly 3,000 in the second quarter of 2015.[81]
- The use of Naloxone may be decreasing the proportion of overdoses that are fatal. While the number of opioid-related EMS transport incidents increased 18% in the first two quarters of 2016 compared with the first two quarters of 2015, the death rate from opioid-related overdoses increased at a slower rate than the opioid-related EMS transports.[82]

[81]Massachusetts Department of Public Health. *Opioid-related EMS transports Massachusetts residents: 2013–2015*. www.mass.gov/eohhs/gov/departments/dph/stop-addiction/current-statistics.html. November 2015.
[82]Massachusetts Department of Public Health. *Opioid-related EMS transports Massachusetts residents: 2013–2015*. www.mass.gov/eohhs/gov/departments/dph/stop-addiction/current-statistics.html. November 2015.

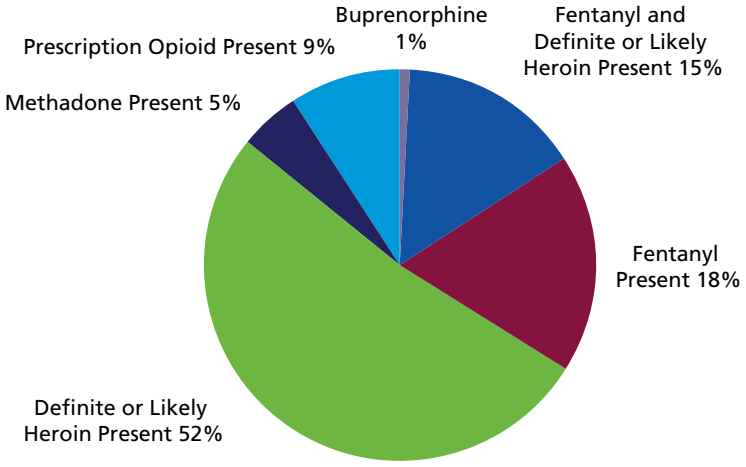
Opioid-Related Deaths, All Intents by Month Massachusetts Residents: January 2015–September 2016



Data Source: Massachusetts Department of Public Health. *Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents*, Posted November 2016.

- In 2016, there were 1,488 confirmed and estimated opioid deaths between January and September, indicating the continued escalation of the epidemic.[83]

Fatal Opioid-Related Overdoses Mutually Exclusive Toxicology Categories: 2013–2014

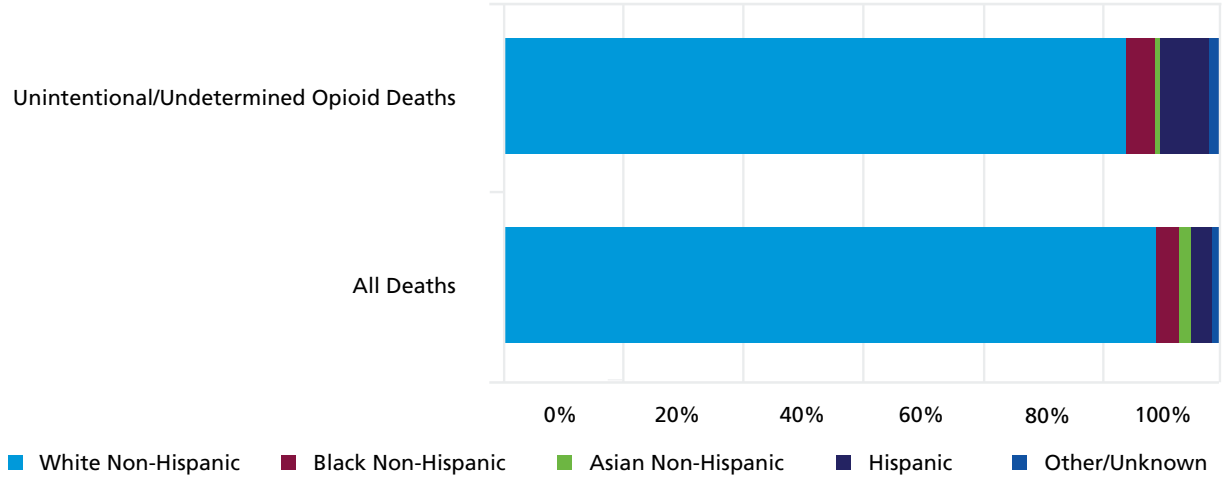


Data Source: Massachusetts Department of Public Health. *Data Brief: An Assessment of Opioid-Related Deaths in Massachusetts 2013–2014,* Posted September 2016.

[83]Massachusetts Department of Public Health. *Data brief: opioid-related overdose deaths among Massachusetts residents, November 2016.* The 1488 number cited is derived from the monthly totals in the chart on page 1.

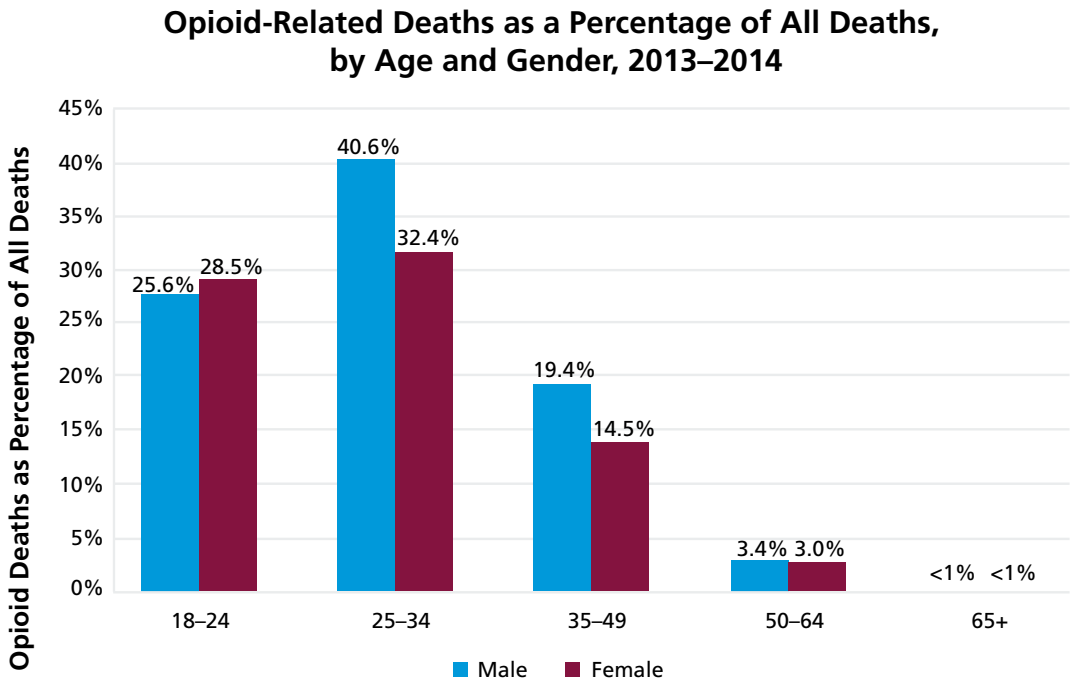
- According to toxicology reports from 2013 and 2014 on 1,657 fatal overdoses, an estimated 85% had fentanyl and/or heroin in the toxicology analysis.
- Fentanyl is a synthetic opioid that has effects similar to heroin, but is much stronger. It can be prescribed for severe pain.
- The increasing mixing of fentanyl with heroin in drugs sold on the street appears to be linked to the spike in opioid-related deaths.

Unintentional/Undetermined Opioid-Related Deaths Compared to All Deaths By Race/Ethnicity, 2015



Data Source: Massachusetts Department of Public Health, *Data Brief: Opioid-Related Overdose Deaths Among Massachusetts Residents*, May 2016.

- The majority of unintentional/undetermined opioid-related deaths are among people who are White and non-Hispanic. Compared to overall deaths by race, however, Whites are at a lower risk of dying from an opioid-related overdose. People who are Hispanic are at higher risk of dying from opioid-related overdoses than other ethnicities, and Asians are at lower risk.

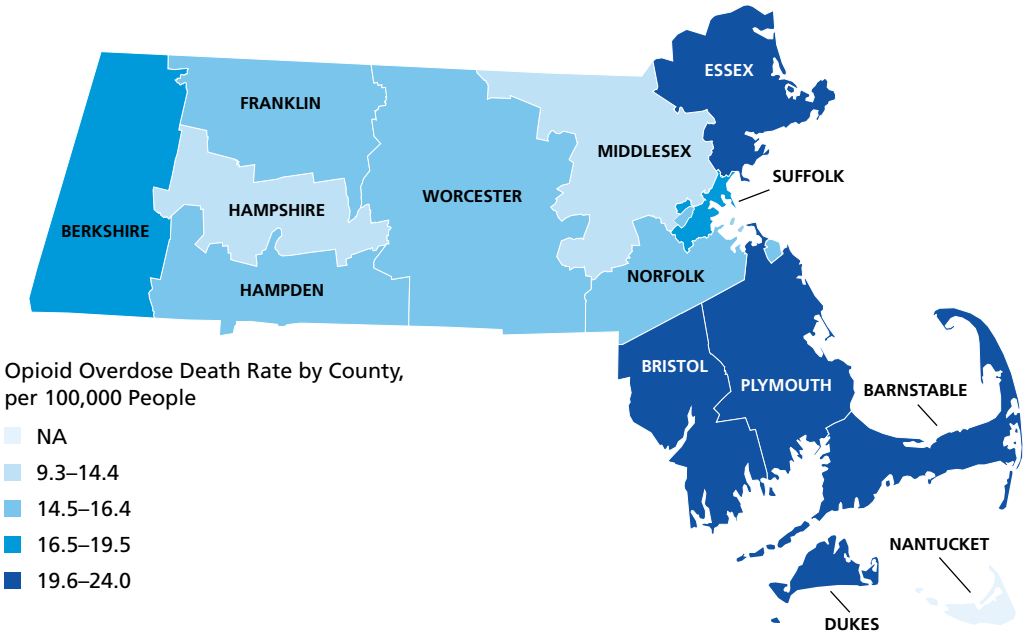


Data Source: Massachusetts Department of Public Health, *Data Brief: An Assessment of Opioid-Related Deaths in Massachusetts 2013–2014*, posted September 2016.

- Young people under 35 are at especially high risk of dying from an opioid-related overdose.
- In 2013–2014, opioids accounted for more than a quarter of all fatalities for people in the 18–24 age group.
- For those 25–34 years of age, opioids caused more than a third of all deaths, and more than 40% of all deaths for men in this age group.
- In 2015, about two thirds of people who died from opioids were younger than 44, while among overall deaths this age group only accounts for 6% of deaths (data not shown).[84]
- Another key demographic at high risk for overdose deaths are former inmates. Those who have recently been released from Massachusetts prisons have a short-term risk from death from opioid-related overdose that is 50 times greater than the risk for the general public (data not shown).[85]

[84]Massachusetts Department of Public Health. *Data brief: Confirmed unintentional/undetermined opioid-related overdose deaths among Massachusetts residents — demographic data highlights, May 2016.*
[85]Massachusetts Department of Public Health. *Data brief: An assessment of opioid-related deaths in Massachusetts 2013–2014.* September 2016.

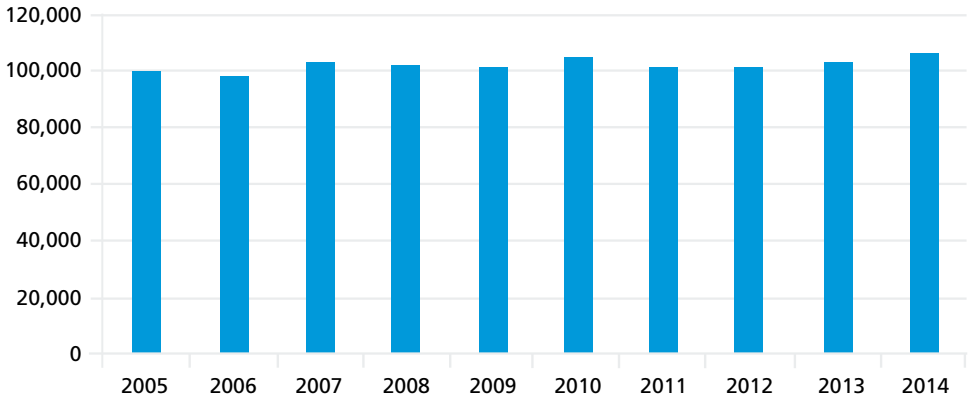
Unintentional Opioid Overdose Death Rates by County, January 2013–December 2015



Notes
1. All data updated on 09/30/2016. Unintentional poisoning/overdose deaths combine unintentional and undetermined intents. Cases were defined using the International Classification of Disease (ICD-10) codes for mortality using the following codes in the underlying cause of death field: X40-X49, Y10-Y19. All multiple cause of death fields were then used to identify an opioid-related death, using the following ICD-10 codes: T40.0, T40.1,T40.2, T40.3, T40.4, and T40.6.
2. Opioids include heroin, opioid-based prescription painkillers, and other unspecified opioids.
3. Please note that 2014 and 2015 death data are preliminary and subject to updates.
4. Rates computed for smaller counties (populations <10,000) are likely to vary significantly from year to year.
5. Low rates of unintentional opioid overdose deaths in a county should not be taken as an indication that there is no opioid abuse problem in that community.
6. County level opioid overdose death rates are computed by averaging the number of opioid-related deaths between January 2013 and December 2015 by the estimated population in the community in that same time period. County is based on county of residence for the decendent.
7. The rate is expressed as a value per 100,000 residents.

- Rates of opioid deaths vary by geographic region, with Southeastern MA counties and Essex County being hit the hardest.

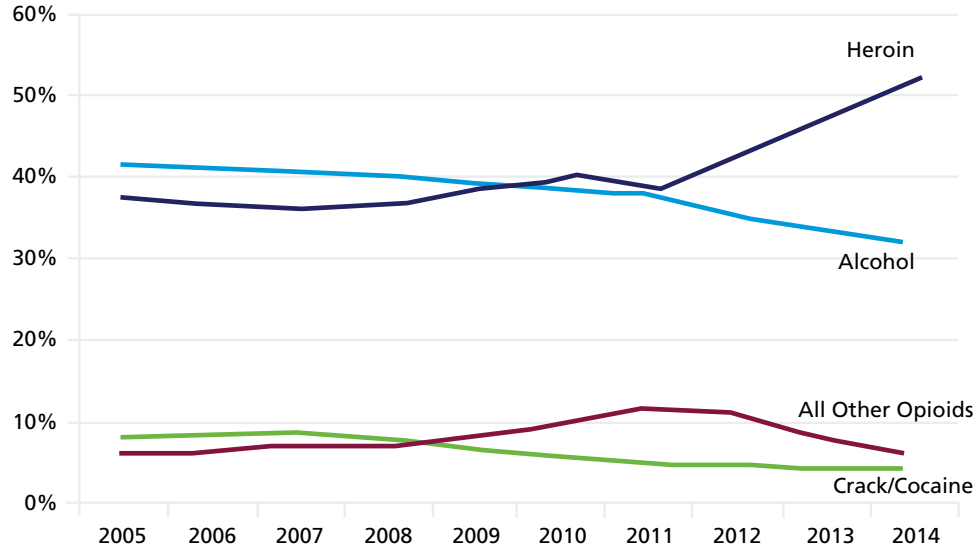
Bureau of Substance Abuse Services Admissions, with an Identified Primary Substance, 2005–2014



Data Source: Adapted from Massachusetts Department of Public Health, www.mass.gov/eohhs/docs/dph/substance-abuse/care-principles/state-and-city-town-admissions-fy14.pdf.

- The number of admissions to Bureau of Substance Abuse Services (BSAS) contracted/licensed programs has remained relatively flat, with a small increase in admission of 3,600 between 2011 and 2014.
- In 2014, there were 107,358 admissions and 85,823 people were admitted to BSAS programs. The admissions figure is higher than the chart because it includes admissions where a primary substance misused was not identified.
- In 2014, 17.6% of people served in BSAS programs are identified as homeless.
- In 2014, 44% have had prior mental health treatment.
- In 2014, 50% have used needles to inject drugs in the past year.

Trends in Primary Drug in BSAS Admissions, 2005–2014



Data Source: Massachusetts Department of Public Health, www.mass.gov/eohhs/docs/dph/substance-abuse/care-principles/state-and-city-town-admissions-fy14.pdf.

- As use of heroin has escalated, so has treatment for heroin as the primary drug used. Treatment for use of alcohol has declined, as has cocaine.
- Treatment for use of other opioids increased between 2005 and 2011 but has been decreasing since then.
- Treatment for marijuana use, not shown on this chart, is now 4% of admissions.

Summary

The opioid epidemic is at a crisis level and shifts rapidly in Massachusetts. The rate of overdoses and deaths are affected by the types of opioids available on the street, with many drugs sold today having increased risk of overdose. Public health policies such as regulating prescribing of opiates, making medication-assisted treatment more available, providing prisoners on release with medication-assisted treatment and linking them to outpatient treatment on discharge, and making opiate reversal agents more available all play a role in combatting this epidemic. The trend data shows how quickly death rates and substances used change.

It is critical that the Commonwealth continue to address the crisis on multiple fronts and measure the impact of policy changes.

Policy Perspective

Despite a rising rate of overdose deaths and continued concern about the persistence of the opioid epidemic, Massachusetts has made significant progress to set in motion strategies that will, in the long run, make a difference. The Governor's Opioid Working Group made 65 recommendations for prevention, intervention, treatment, and recovery. To the administration's credit, most of those recommendations have resulted in action. We have additional treatment beds, expanded access to addiction medications and the overdose reversal drug, a revamped prescription monitoring system, improvements in addiction education in our medical schools, and at least four legislative bill filings covering a host of related issues. The governor has helped reduce the stigma of addiction by communicating it as a public health issue, not a reflection of weak will or character. While these steps will not result in an immediate solution to a crisis nearly 20 years in the making, they are a clear signal that Massachusetts is committed to changing the conversation about a stigmatized disease.

To leverage this positive action, legislators, policymakers, insurers, health care providers, and our collective communities must broaden our efforts. Prevention, early intervention, integration with medical care, and more robust community-based supports for those in recovery are critical to establish a proactive health maintenance system. Specific recommendations include:

1. Significant funding increases for innovative prevention initiatives. Community coalitions, school-based services, and collaboration with all sectors (business, law enforcement, etc.) can change community culture about alcohol and drugs if they are sustained over time.
2. Integration of behavioral health clinicians in primary and specialty medical practices. Full integration embeds clinicians in these practices to conduct universal screenings, consult with physicians, teach coping and life management skills, and do brief interventional counseling.
3. Greater investment in community-based treatment and recovery management. Reducing the pressure on access to treatment beds cannot be solved by endlessly increasing bed capacity. Expanded access to addiction anti-craving medications and improvement of recovery maintenance supports are necessary if we are to reduce readmissions to detox and rehab centers.

4. Establish and fund scientific research and challenge it to find breakthrough solutions for substance use disorders. A disease that impacts so many Americans demands more than the $67,000,000 spent nationally in 2015 on substance use prevention research.[86]

While action has been taken on some of these ideas, we still have not made the investment commensurate with the scope of addiction's impact on our society. We can prevent another opioid epidemic if we think beyond crisis and lay the foundation for a healthier Commonwealth.

Ray Tamasi
President
Gosnold on Cape Cod

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3.7 Mental Illness

Mental health is an integral part of overall health and wellness, and any review of population health needs to include the impact of mental health disorders on the health of the community. Mental disorders are common and affect all age groups and people from all walks of life.

Mental disorders act on a person's mood, thinking, and behaviors, affecting how people relate to others and make choices. There are many forms of mental disorders, from anxiety and mood disorders, such as depression, to disorders that reduce a person's ability to focus or behave appropriately. Some less common mental illnesses cause unwanted, intrusive thoughts or result in hallucinations or false beliefs about basic aspects of reality.

[86]National Institutes of Health. *Estimates of funding for various research, condition, and disease categories*. February 2016.

According to the Substance Abuse and Mental Health Services Administration's 2014 National Survey on Drug Use and Health (NSDUH), an estimated 43.6 million (18.1%) adult Americans have experienced some form of mental illness. Anxiety and depressive disorders are the two most common types of mental disorders. Mental disorders can occur once, reoccur intermittently, or be more chronic in nature. Mental disorders frequently co-occur with each other and with substance use disorders.[87]

Serious mental illness among adults 18 and older is defined as "having, at any time during the past year, a diagnosable mental, behavior, or emotional disorder that causes serious functional impairment that substantially interferes with or limits one or more major life activities." Serious mental illnesses include major depression, schizophrenia, and bipolar disorder, and other mental disorders that cause serious impairment. In 2014, an estimated 4.1% of the adult population in the United States had a serious mental illness in the past year.[88]

Serious mental illness is strongly linked with adverse physical health conditions; studies have shown that public mental health clients die at much younger ages, losing decades of potential life. Those with major mental illness diagnoses lose more years of life than those with less serious mental illness diagnoses. The most frequent cause of deaths among those with mental illness are similar to the leading causes of death generally and include heart disease, cancer, and cerebrovascular, respiratory, and lung diseases.[89]

The impact on physical health is not limited to those with serious mental illness. Mental disorders, especially depressive disorders, are strongly related to many chronic diseases including diabetes, cancer, cardiovascular disease, asthma, and obesity as well as risk behaviors such as physical inactivity, smoking, excessive drinking, and insufficient sleep.[90] The prevalence of mental health disorders, their co-occurrence with physical illness, and impact on overall health and well-being has become a focus of the health system in recent years, with a movement toward providing integrated mental health and physical health care in the primary care system, as well as providing better primary care services to people with serious mental illness served in the public mental health system.

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[87]Center for Behavioral Health Statistics and Quality. Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health (HHS Publication No. SMA 15-4927, NSDUH Series H-50). www.samhsa.gov/data. 2015.

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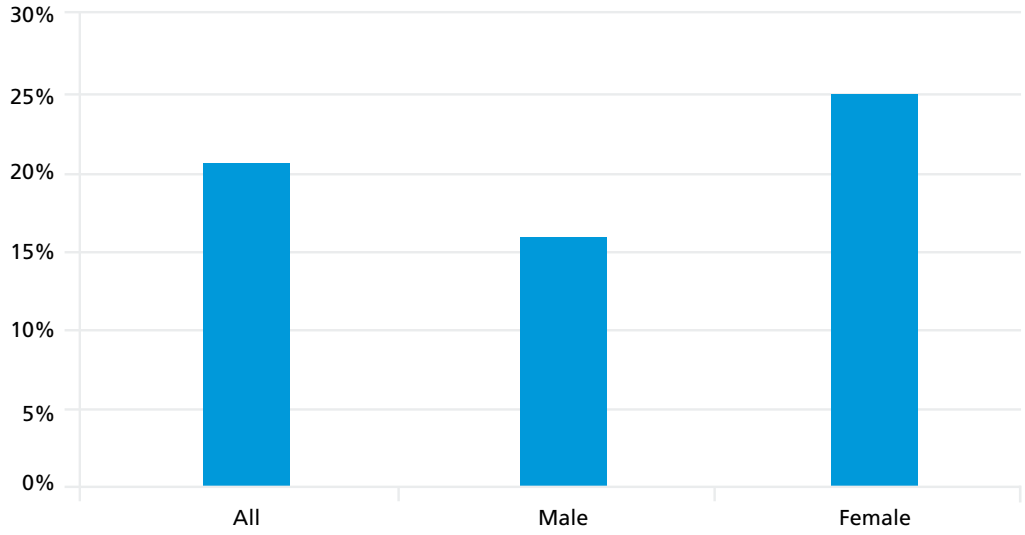
[89]Colton CW, Manderscheid RW. Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Prev Chronic Dis.* www.cdc.gov/pcd/issues/2006/apr/05_0180.htm. Published April 2006 Accessed September 28, 2016.

[90]Chapman DP, Perry GS, Strine TW. The vital link between chronic disease and depressive disorders. *Prev Chronic Dis.* 2005; 2(1): A14. Cited in www.cdc.gov/mentalhealth/basics.htm.

Trends

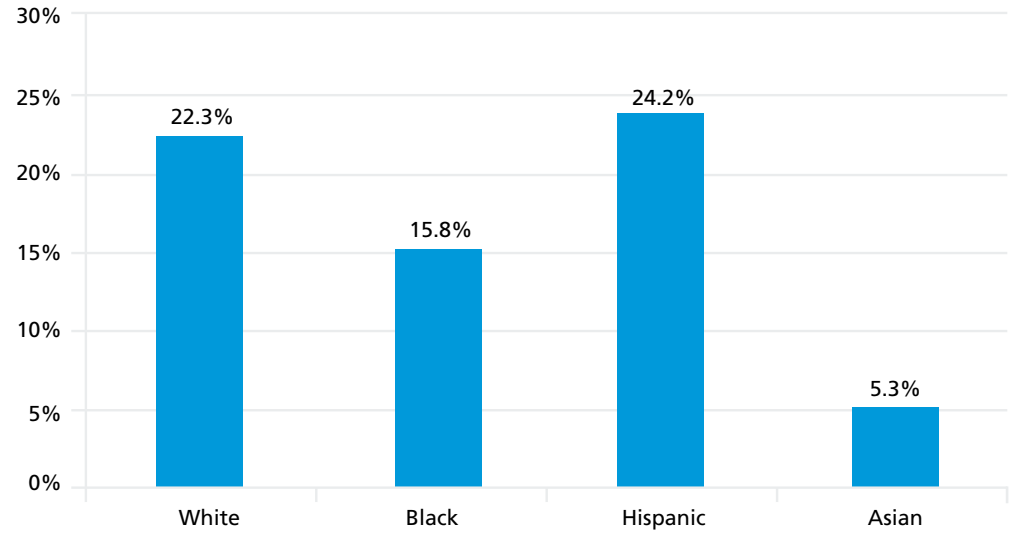
Percent Ever Diagnosed with Depression in Massachusetts, 2015



Source: Massachusetts Department of Public Health, *Behavioral Risk Factor Surveillance System*, 2015

- 21% of adults in Massachusetts report having been diagnosed with depressive disorder at some point in their lives.
- Women report higher rates of depression diagnoses than men.

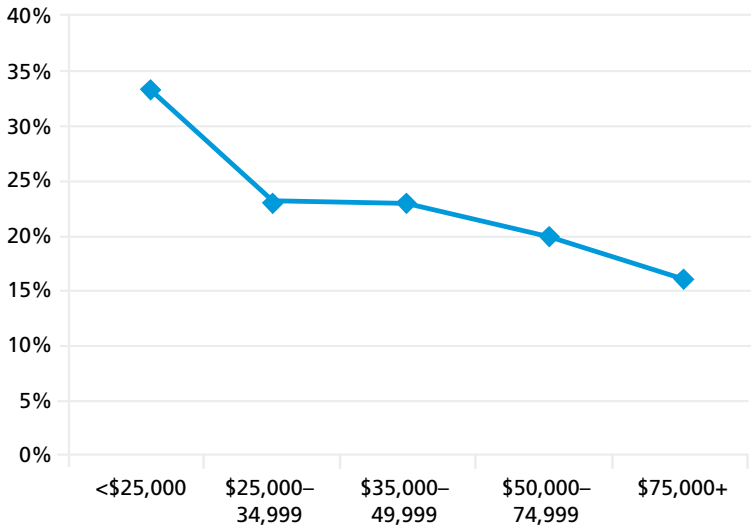
Percent Ever Diagnosed with Depression, by Race/Ethnicity, 2015



Source: Massachusetts Department of Public Health, *Behavioral Risk Factor Surveillance System*, 2015

- Diagnoses of depression is much more frequently reported by people who are White (22%) or Hispanic (24%). Prevalence of depression is particularly low among those who are Asian (5%).

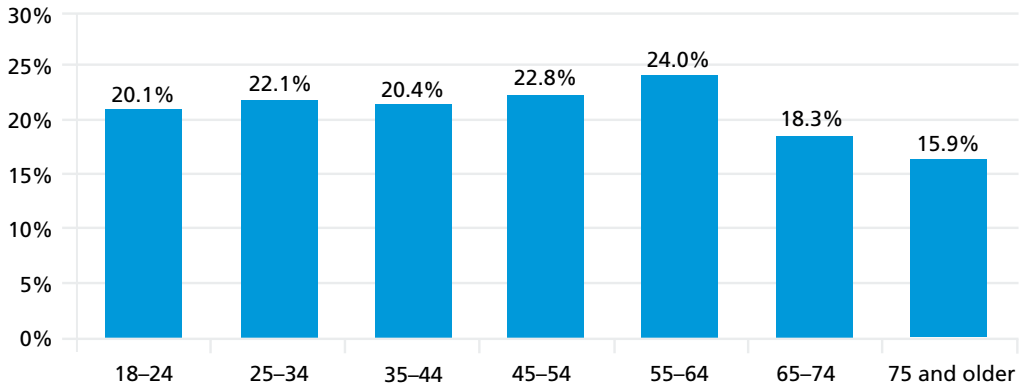
Percent of Adults Ever Diagnosed with Depression by Income in Massachusetts, 2015



Source: Massachusetts Department of Public Health, *Behavioral Risk Factor Surveillance System, 2015.*

- Reported diagnoses of depression correlate with income; 34% of people with lowest incomes report having been diagnosed with depression. This rate declines as income increases. About 15% of those who earn over $75,000 per year report ever having been diagnosed with depression.

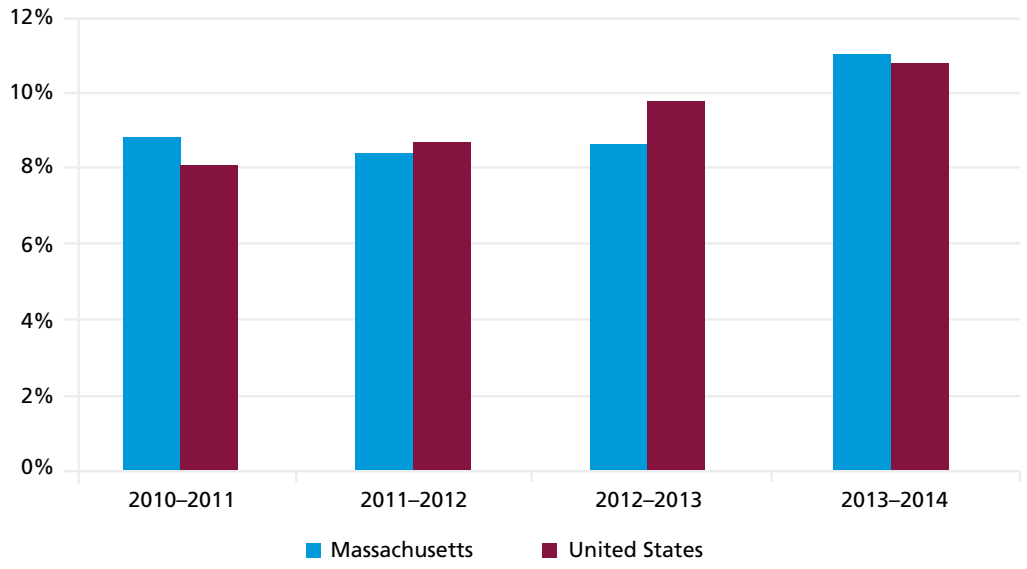
Percentage of Adults Ever Diagnosed with Depression in Massachusetts, by Age, 2015



Data Source: Massachusetts Department of Public Health, *Behavioral Risk Factor Surveillance System*, 2015

- For all age groups between 18 and 64, rates of ever being diagnosed with depression range from 20 to 24%. Because the survey question that produces these data asks not for current diagnosis but whether one has ever been diagnosed with depression, the higher rates of depression among those 55–64 does not necessarily indicate that this age group is more depressed than those younger.
- The lower rates of ever being diagnosed with depression for those over 65 may reflect either lower rates of depression among older cohorts, or less screening for depression in primary care when this older cohort of people was younger.

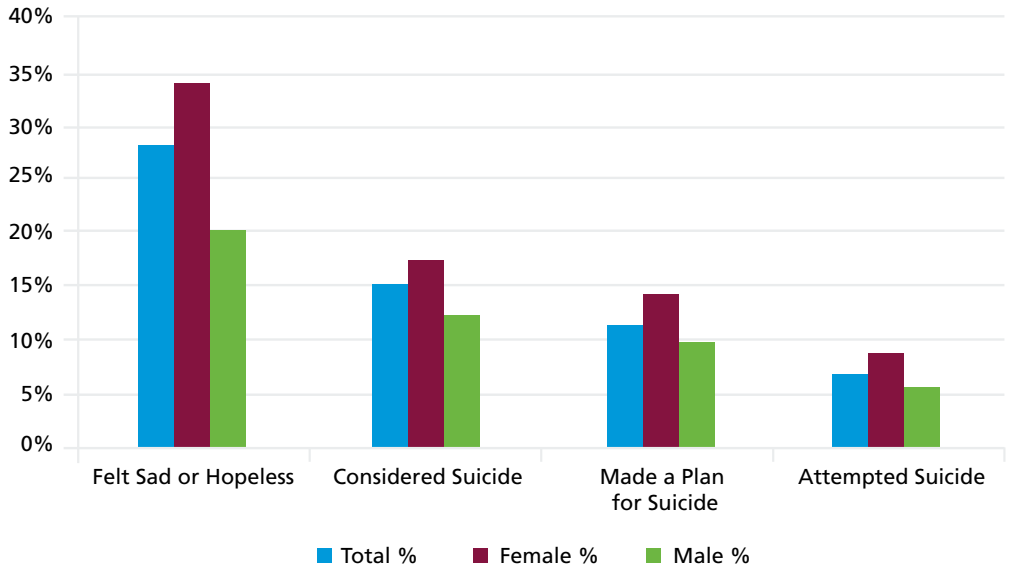
Past Year Major Depressive Episode Among Adolescents Aged 12–17 in Massachusetts and the United States



Data Source: SA, *Behavioral Health Barometer*, Massachusetts 2015

- Rates of major depressive episodes among adolescents is trending up in both Massachusetts and the United States, with 11% of Massachusetts adolescents reporting a major depressive episode in 2013–2014.

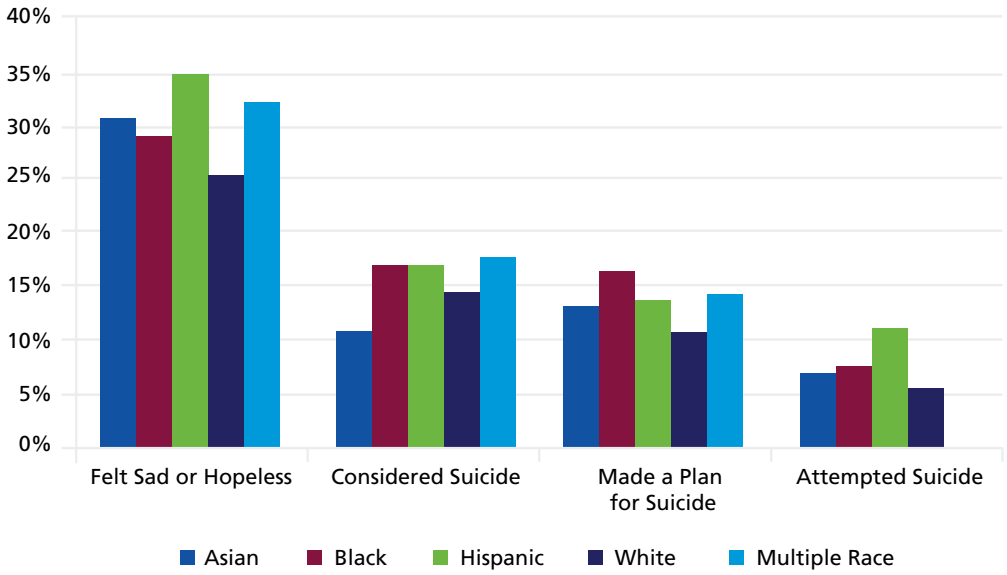
Depression and Suicide Ideation and Attempt Among Massachusetts High School Students, 2015



Data Source: Centers for Disease Control, *Youth Risk Behavior Survey*, Massachusetts 2015.

- 35% of girls and 20% of boys in high school reported they felt sad or hopeless almost every day for two or more weeks in a row so that they stopped doing some usual activities during the prior 12 months; this is a much higher rate than that found in surveys of formal diagnoses of major depressive episodes.
- Massachusetts' overall rate of high school students feeling sad or hopeless is slightly lower than the national average — 27.4% compared to 29.9%.
- 15% of Massachusetts high school students report having considered suicide, with 12% having made a plan and 7% having made an attempt in the prior year.
- Again, Massachusetts rates are somewhat lower than the national average. In the United States as a whole, 18% of high school students report having considered suicide, with 15% having made a plan, and 9% having made an attempt in the prior year.
- While 7% of youth reported a suicide attempt in the past year, 2.8% reported an attempt that resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse.
- In all the indicators, girls have a higher rate of depressive symptoms and suicide ideation than boys.

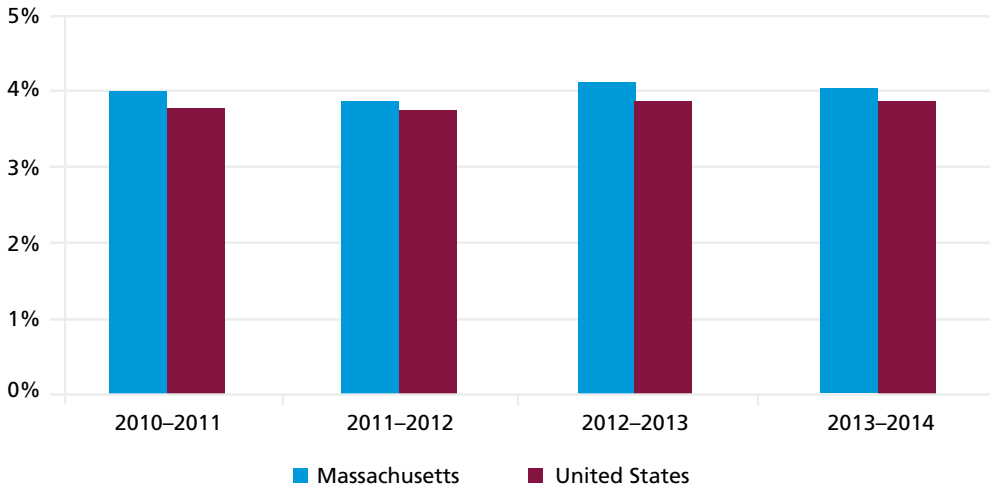
Depressive Symptoms and Suicide Ideation and Attempts by Race in Massachusetts, 2015



Data Source: Centers for Disease Control, *Youth Risk Behavior Survey*, Massachusetts 2015.

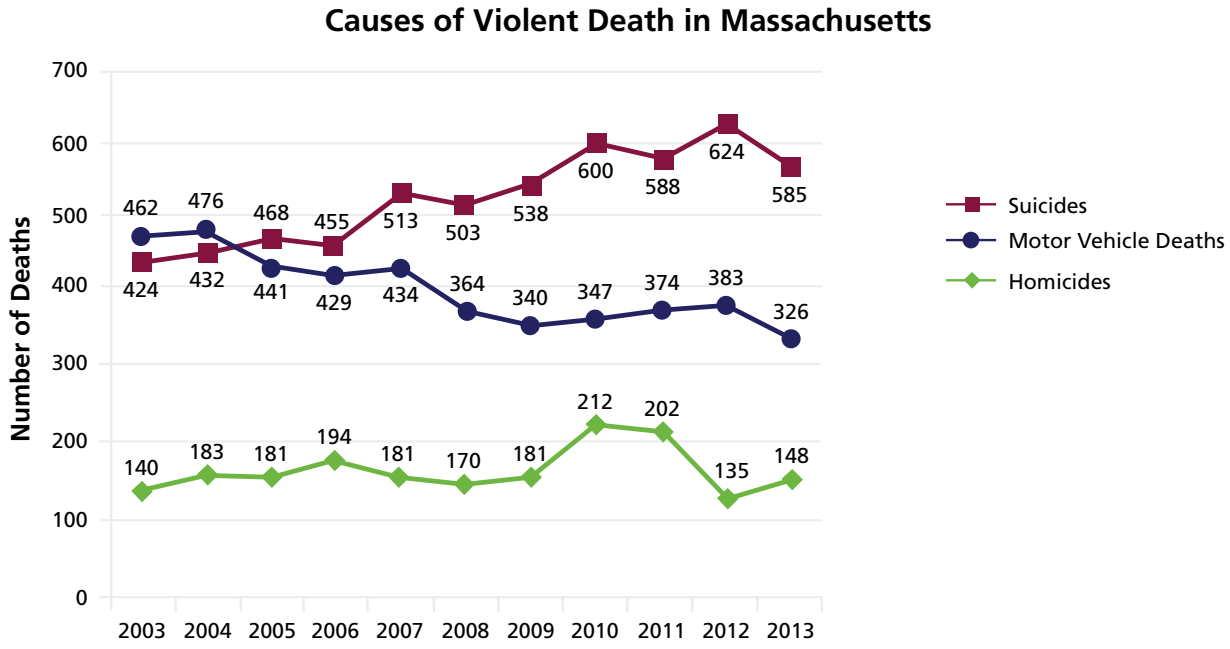
- Depression and suicide risk is an issue for high school students regardless of race or ethnicity, although White students do have significantly lower rates of feeling sad or hopeless, as well as lower rates of suicide ideation or attempts.
- 35% of Hispanic students report feeling sad or hopeless, compared to 27% of all high school youth; while Hispanic students do not have higher rates of suicide ideation, they do have higher rates of attempting suicide, with 11% reporting having attempted suicide in the prior 12 months.

Thoughts of Suicide Among Adults Aged 18 or Older in Massachusetts and the United States



Data Source: SAMHSA, Center for Behavioral Health Statistics and Quality, *National Surveys on Drug Use and Health, 2010–2011 to 2013–2014.*

- The percentage of adults with suicidal thoughts (4%) is similar in Massachusetts as in the rest of the country (3.9%). These rates have not changed significantly since 2010.

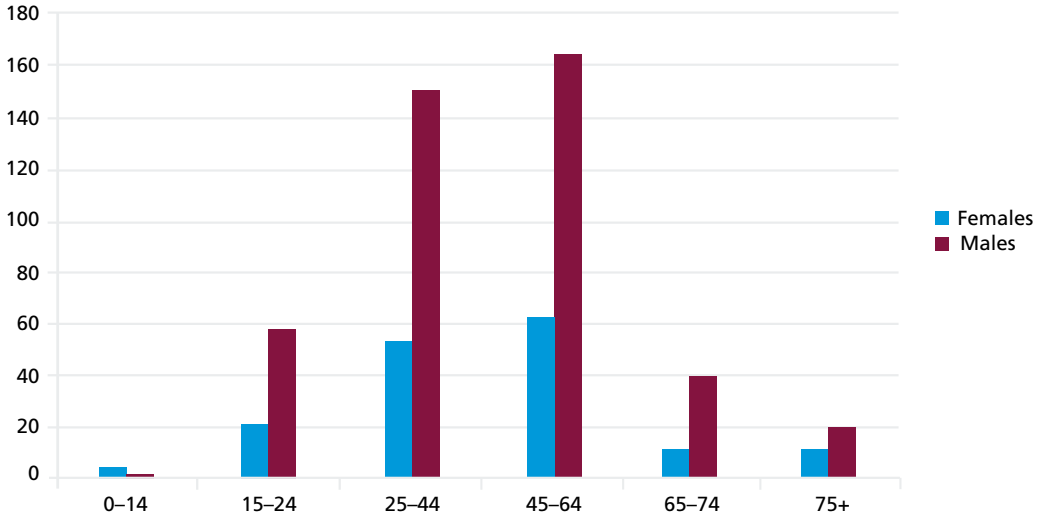


Data Source: Massachusetts Violent Death Reporting System, MA Dept. of Public Health, Fatality Analysis System, National Highway Traffic Safety Administration, cited in *Data Brief 2013 Suicides and Self-Inflicted Injuries in Massachusetts*, Injury Surveillance Program, DPH, Winter 2016.

- While rates of thoughts of suicide have not increased significantly over the last few years according to survey results, the actual incidence of completed suicides in Massachusetts has been increasing over the last 10 years.
- Suicide rates in Massachusetts increased an average of 3.5% annually between 2003 and 2013. The overall increase in this time period was close to 32%, with the suicide rate increasing from 6.6/100,000 to 8.3/100,000.[91] This increase mirrors increases in suicide rates seen nationally, although Massachusetts still has a lower rate of suicide compared to the United States as a whole, which stands at 12.6/100,000.
- In 2014, there were 6,885 emergency department visits for self-inflicted injuries, and 4,129 hospital discharges for self-inflicted injuries.[92]

[91]Department of Public Health, Injury Surveillance Program. *Data brief 2013: Suicides and self-inflicted injuries in Massachusetts*. Winter 2016.
[92]MA Inpatient Hospital Dischage Database and MA Emergency Department Discharge Database, MA Center for Health Information and Analysis, cited in *Data brief 2013: Suicides and self-inflicted injuries in Massachusetts*, Department of Public Health, Injury Surveillance Program. Winter 2016

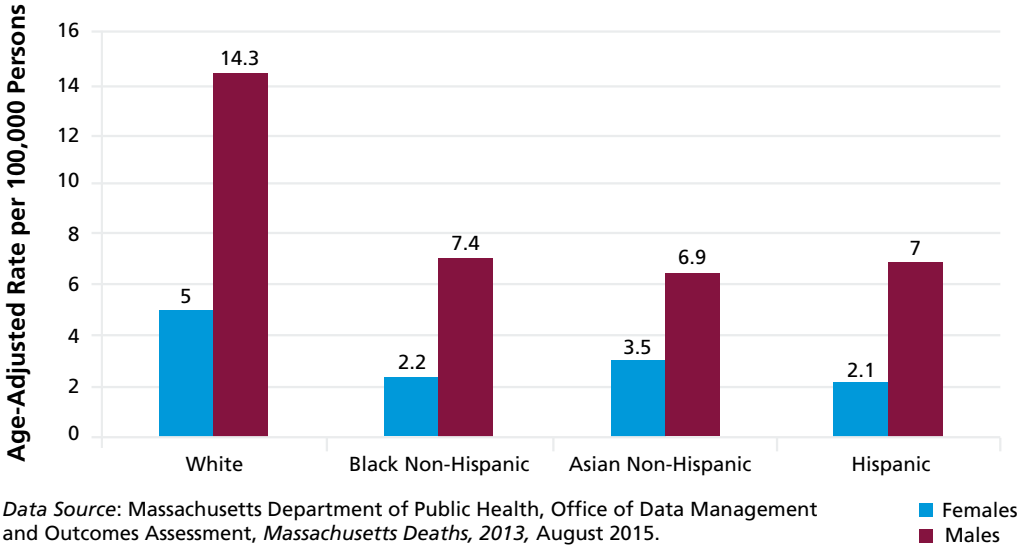
Suicides by Gender and Age in Massachusetts, 2013



Data Source: Massachusetts Department of Public Health, Office of Data Management and Outcomes Assessment, Massachusetts Deaths, 2013, August 2015.

- Suicide is more common among men, especially middle-aged men.

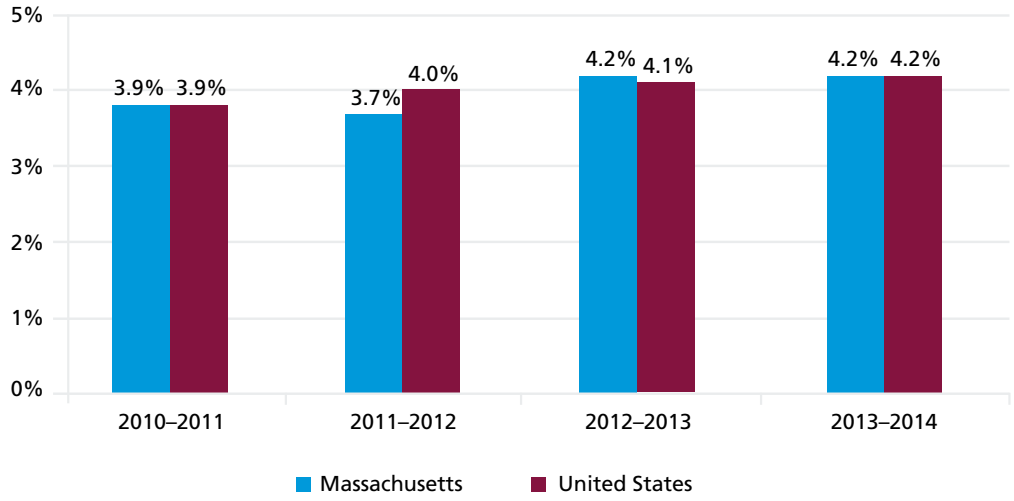
Suicide Rates by Race, Hispanic Ethnicity, and Gender, Massachusetts, 2013



Data Source: Massachusetts Department of Public Health, Office of Data Management and Outcomes Assessment, *Massachusetts Deaths, 2013,* August 2015.

- White men have a suicide rate double that of men of other races and ethnicities.
- Massachusetts tracks the circumstances for suicides in the Violent Death Reporting System maintained by the Massachusetts Department of Mental Health. Of the 585 suicides in 2013, 51% of victims had a documented current mental health problem, 39% were currently receiving treatment for mental health or substance misuse problem, and 30% had an alcohol or other substance use problem.
- 22% of suicide victims had experienced an intimate partner problem, such as divorce or break-up or conflict. Other reported circumstances include job or financial problems (14%) or physical health problems (14%).

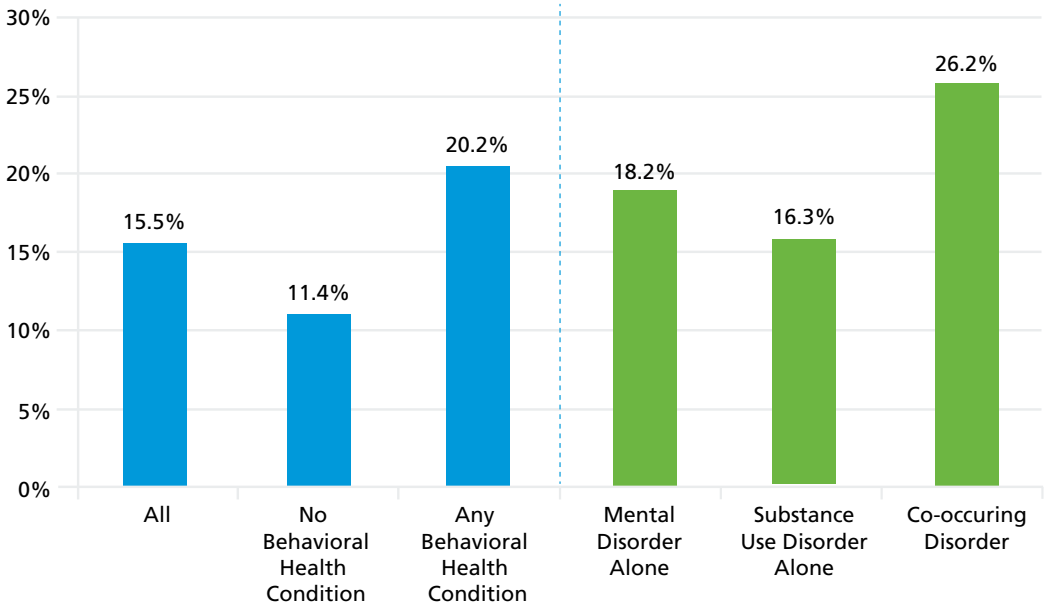
Past Year Serious Mental Illness (SMI) Among Adults Aged 18 or Older in Massachusetts and the United States



Data Source: SAMHSA, Center for Behavioral Health Statistics and Quality, *National Surveys on Drug Use and Health, 2010–2011 to 2013–2014.*

- The percentage of adults with a serious mental illness is similar in Massachusetts (4.2%) as in the rest of the country (4.2%). These rates have not changed significantly since 2010.

Acute Hospital Readmission Rates in Massachusetts, SFY 2014



Data Source: Massachusetts Center for Health Information and Analysis, *Massachusetts Hospital Inpatient Discharge Database*, July 2013–June 2014.

- The Center for Health Information and Analysis analyzed acute hospital readmissions for all diagnoses and calculated readmission rates for people with a co-occurring mental health disorder, substance use disorder, or co-occurring mental health and substance use disorders, and compared these readmission rates to people without a comorbidity.
- The results of this analysis showed that readmissions to acute hospitals for non-behavioral health conditions is much more likely for patients with a behavioral health comorbidity than those who do not have such a comorbidity, illustrating the impact of behavioral health on other medical conditions.
- This has implications for total health care costs, as those with mental health conditions account for a disproportionately higher share of overall health care costs.
- Patients with a behavioral health comorbidity that includes both mental health and substance use disorders have the highest acute hospital readmission rate — 26.2% are readmitted, compared to 11.4% of those who have no behavioral health comorbidity.

Summary

Massachusetts fares better than much of the country in terms of mental health and the prevalence of mental disorders and suicide rates. However, the numbers of people reporting depressive symptoms or being formally diagnosed with depression is high for both adults and youth. The incidence of suicide has been increasing over the last 10 years, and now is 1.8 times the rate of deaths from motor vehicles.

The increasing rates of adolescents reporting depressive symptoms and suicide ideation is concerning in Massachusetts and across the country. The impact of mental health disorders hits a large segment of the population, not just the 4% of the population who suffer from serious mental illness or who are served in the public mental health system.

Mental health disorders are linked to social determinants of health, especially income. While mental health disorders cause disability and distress on their own, mental health disorders are also linked with comorbid physical health disorders such as heart disease and diabetes, and affect the treatment and course of these comorbid medical conditions.

Policy Perspective

There is a silent crisis in outpatient mental health care. While unmet workforce needs challenge all of health care, they are compounded in behavioral health by decades of low reimbursement rates. Clinics are closing or reducing access. Adults and children are waiting weeks or months for outpatient care.

We have made tremendous strides promoting access to mental health services. The Mental Health Parity and Addiction Equity Act and the Affordable Care Act unequivocally establish that behavioral health care is integral to health care.

Care delivery is shifting within the Triple Aim framework. Team-based, person-centered care can improve quality. Better integrated, coordinated care for individuals with behavioral health needs may improve health outcomes and reduce unnecessary costs.

In Massachusetts, public policymakers have put forth a bold new vision for Medicaid members that partners ACOs with Community Partners (CPs), community-based organizations expert in serving members with behavioral health needs. This model will hopefully improve quality and reduce overall health expenditures.

If individuals cannot access services *when they need them*, however, transformation will not succeed, and improved individual and population outcomes are unlikely. The Association for Behavioral Healthcare (ABH), an association of community-based, behavioral health care organizations, surveyed our members on the state of outpatient services. Of respondents:

- 68% have reduced outpatient clinic capacity over the past three years to minimize growing financial losses; 45% are actively considering further reductions
- 60% have wait times of at least one month for a child to access a routine prescriber assessment; 58% have wait times of at least one month for adults
- 59% have unfilled psychiatrist positions; 45% have unfilled nurse prescriber positions
- 76% lost money delivering outpatient services in FY15; the average annual loss was $555,000 — 17% of the average operating budget.

These struggles are due largely to poor reimbursement from private and public payers. The Commonwealth recently committed to an unprecedented, multiyear investment in outpatient services. Even with this investment, providers will struggle to deliver outpatient behavioral health services essential to care transformation. If bold visions are to become reality, policymakers and payers must partner on a long-term strategy to adequately resource outpatient behavioral health care.

Vicker V. DiGravio III
President and CEO
Association for Behavioral Healthcare

Policy Perspective

Massachusetts is fortunate that we rank 48th out of all the states and the District of Columbia in the rate of suicide deaths per 100,000, according to the CDC. That translates into 596 deaths in the Commonwealth in 2014 related to suicide. While we fare better than other states, those 596 deaths are really only the tip of the iceberg. According to the American Association of Suicidology, there are on average 25 attempts for every death, which means we have 14,900 people who attempted suicide in 2014 in Massachusetts alone.

While the numbers are staggering, the emotional cost to family and friends is unimaginable. Grief after a suicide loss is like no other and the unanswerable question of "why" remains with the survivors forever.

The financial cost to society is measurable. On a national level, the average cost of a suicide for individuals 25 to 44 years of age is $1,837,842. Of the 596 people who died in 2014 in Massachusetts, approximately 200 were in this age range and their deaths alone represent an economic cost of $367,568,400.

Suicide is a complex issue and there are no easy answers as to why but there are promising directions in the field of suicide prevention. We know that follow-up through check-in calls and encouragement to connect with outpatient treatment after discharge from a psychiatric hospital or emergency department visit is an effective preventive measure. We know that reducing access to lethal means reduces the instance of suicide and we know that untreated and undiagnosed mental health disorders are reported in 90% of suicide deaths.

In order for Massachusetts to reduce the incidence of suicide, the following recommendations are key:

- Work collaboratively with the Massachusetts Coalition for Suicide Prevention (www.masspreventssuicide.org) in their effort to implement the Massachusetts Strategic Plan for Suicide Prevention and advocate for state funding for suicide prevention.
- Join your local regional coalition for suicide prevention — there are 10 of them across the Commonwealth and more information is available at www.masspreventssuicide.org.
- Fund suicide prevention training for licensed school personnel, which would require two hours of suicide prevention training.

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Chief Program Officer
Samaritans, Inc.

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3.8 Oral Disease

An infection is an infection, whether it is an arm, a heart, a lung, or a mouth infection, and it must be treated. Oral health is part of general health. Oral diseases also affect nutrition, digestion, speech, social mobility, employability, self-image, self-esteem, and quality of life. Oral diseases affect almost everyone. About 58% of teenagers and 97% of adults have had tooth decay; however, they are often not treated. Therefore, oral diseases have been called "a neglected epidemic" or "a silent epidemic."[93,94,95,96]

Access to oral disease prevention and treatment is affected dramatically by the social determinants of health, such as race, ethnicity, income, education, and neighborhood, with the most vulnerable populations suffering the most severe consequences. Community water fluoridation (CWF) is the most cost effective prevention measure for better oral health as everyone benefits. CWF is the foundation for better oral health for a community.[97,98,99,100]

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[93]Allukian M. The neglected epidemic and the surgeon general's report: A call to action for better oral health. *Am J Public Health*. September 2008; S82–85.
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Trends

In 2014, 25.3% of adults in Massachusetts had not seen a dentist in the past year, higher than the 2012 figure of 23.8%.[101] Figures have fluctuated since 2000, when 24.2% of adults had not seen a dentist in the past year. In 2014, 15.6% of adults had six or more teeth missing, higher than in 2012, when 14.9% of adults had six or more teeth missing.[102,103]

Among Massachusetts children, 26.9% of middle schoolers in 2013 had a cavity in the previous year, as did 29.6% of high schoolers. These figures were lower than in previous years; in 2007 32.0% of middle schoolers had a cavity in the past year, as did 35% of high schoolers.[104]

The most recent elderly statewide survey on the impact of tooth decay and other oral diseases was in 2009.[105] According to this survey, 59% of nursing home seniors had untreated tooth decay; 74% of seniors in long-term care facilities had gum disease (gingivitis), with 34% having major to urgent dental needs; 79% of seniors at meal sites did not have dental insurance; 35% of seniors at meal sites had untreated decay, with 17% having major to urgent dental needs; and nearly 20% of seniors at meal sites had not had a dental visit in more than five years.[106]

In addition, about 2.7 million residents in 2014 did not have CWF,[107] and in FY 2015 only about 1,695 Massachusetts dentists were active MassHealth (Medicaid) providers (billing over $10,000 a year), about 24% of all licensed dentists.[108]

Groups at Risk

Severe disparities in oral health for high-risk population have always been extensive and continue to exist due to lack of access to prevention programs, dental treatment, and dental providers. Children, the elderly, the low income and less educated as well as racial, cultural, and linguistic minorities are at the highest risk. Other groups at high risk include MassHealth members and the uninsured; people who are homebound, homeless, institutionalized, or medically compromised as well as the developmentally challenged, and people in certain geographic locations with shortages of dental professionals. Access is a serious problem for children on MassHealth; about 46% of all children eligible for MassHealth did not receive any dental services in FY 2015. This is an improvement from 51% in FY 2013, but only 16.8% of all eligible children received restorative treatment, a big step backward from FY 2013.[109,110]

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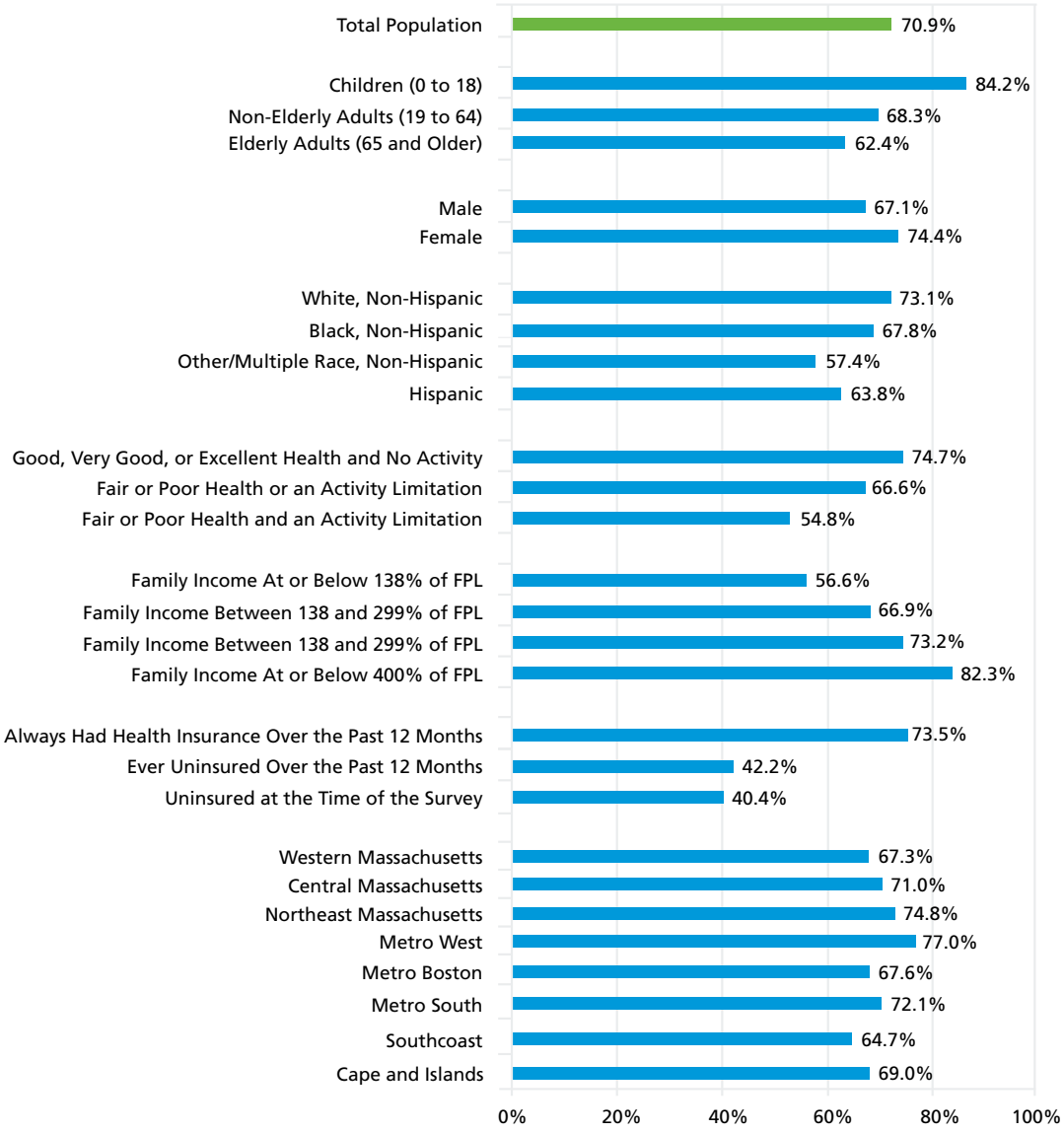
[101]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults: 2014 results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2014.pdf. Published 2014. Accessed November 14, 2016.
[102]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults: 2014 results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2014.pdf. Published 2014. Accessed November 14, 2016.
[103]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults, 2012*. April 2014.
[104]Massachusetts Department of Public Health. *A profile of health among Massachusetts middle and high school students, 2013*. June 2014.
[105]Massachusetts Department of Public Health, Office of Oral Health. *The Commonwealth's high-risk senior population: Results and recommendations from a 2009 statewide oral health assessment*. Boston; July 2010.
[106]Massachusetts Department of Public Health, Office of Oral Health. The Commonwealth's high-risk senior population: Results and recommendations from a 2009 statewide oral health assessment. Boston; July 2010.
[107]Allukian M. Wong C. Fluoridation update 2014. *J Mass Dental Soc*. 2014; 63(2): 24–30.
[108]Seifert R. Personal communication. October 6, 2016.
[109]Seifert R. Personal communication. October 6, 2016.
[110]Center for Medicaid and CHIP Services. FFY 2015 number of children ever-enrolled in Medicaid and CHIP. www.medicaid.gov/chip/downloads/fy-2015-childrens-enrollment-report.pdf.

In 2015, about 60% of the uninsured and 58% of those ever uninsured in the past year and 35% of those in fair or poor health with an activity limitation had not been to a dentist in the last year, (see figure).[111] In addition for adults in 2014, 40.4% of those with less than a high school education, 40.5% of those with incomes less than $25,000, and 32.2% of Blacks had not been to a dentist in the last year.[112] This compared to 23.6% of Whites who had not had a dental visit in the last year, 15.7% of those with a college education, and 14% of those making more than $75,000 a year.[113]

Had a Dental Care Visit in Past 12 Months, Massachusetts 2015

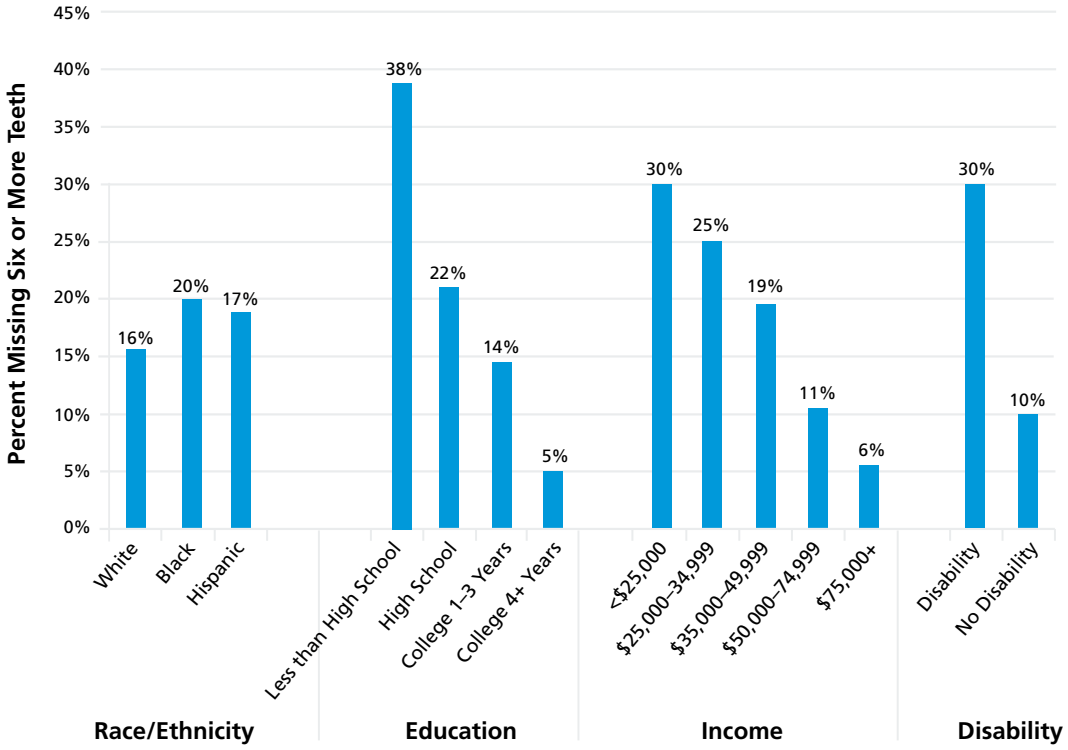


Source: Massachusetts Center for Health Information and Analysis, *2015 Massachusetts Health Insurance Survey*.

[111]Massachusetts Center for Health Information and Analysis. *2015 Massachusetts health insurance survey*.
[112]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults: 2014 results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2014.pdf. Published 2014. Accessed November 14, 2016.
[113]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults: 2014 results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2014.pdf. Published 2014. Accessed November 14, 2016.

About 38% of adults with less than a high school education and 30% of adults with a disability had six or more missing teeth compared to 5% of college educated adults and 10% of those without a disability[114] (see figure below). Seniors in long-term care facilities also face particular problems accessing dental care; the three major barriers are the cost of dental care, lack of insurance, and the lack of available or interested dentists. The lack of basic dental care benefits in Medicare increases the barriers for all seniors to accessing treatment. People living in certain geographic locations are also more likely to have difficulty accessing dental care. In 2016, there were over 500,000 people living in 62 federally designated dental shortage areas in Massachusetts with an increase in the underserved population of almost 20% from 2014.[115] Those living in shortage areas are less likely to see a dentist than those living in areas without a shortage.[116,117] The level of unmet dental need is about 48% in these 62 areas.[118]

Percent of Massachusetts Adults Ages 18 and Over Missing Six or More Teeth, 2014



Source: Massachusetts Department of Public, *A Profile of Health Among Massachusetts Adults 2014*.

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[114]Massachusetts Department of Public Health. *A profile of health among Massachusetts adults: 2014 results from the Behavioral Risk Factor Surveillance System*. www.mass.gov/eohhs/docs/dph/behavioral-risk/report-2014.pdf. Published 2014. Accessed November 14, 2016.

[115]Kaiser Family Foundation. *Dental care health professional shortage area*. http://kff.org/other/state-indicator/dental-care-health-professional-shortage-areas-hpsas/?currentTimeframe=0&selectedRows=%7B%22nested%22:%7B%22massachusetts%22:%7B%7D%7D%7D.

[116]U.S. Department of Health and Human Services, Health Resources and Services Administration. Designated health professional shortage areas statistics. http://datawarehouse.hrsa.gov/Tools/quickreports.aspx. Published January 1, 2016.

[117]Massachusetts Department of Public Health, Office of Oral Health. The status of oral disease in Massachusetts: A Great Unmet Need. www.mass.gov/eohhs/docs/dph/com-health/oral-health-burden.pdf. Boston; 2009.

[118]Bureau of Clinician Recruitment and Service, Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services. *HRSA Data Warehouse: Designated Health Professional Shortage Areas Statistics, as of September 9, 2016.*

Emergency Room Dental Visits

When there is limited access to dental care, the emergency room becomes the dental provider. There were 366,060 preventable dental visits to hospital emergency rooms in 2014 at a cost of $14–36 million, 60% of them during being the work day.[119] MassHealth members were 48.8% of the visits, followed by patients with commercial insurance 20.4%, then the uninsured 14.5%, and Medicare 10.9%. MassHealth children had six times more emergency visits than the commercial insurance and nonelderly adults had seven times more.[120]

About 22% of low-income adults stated that the appearance of their mouth and teeth affect their ability to interview for a job, and 36% avoid smiling due to their mouth conditions. The main reasons for not visiting a dentist were cost (55%), fear (28%), and location or finding a dentist (24%).[121]

Risk and Protective Factors

Community Water Fluoridation

Community water fluoridation prevents tooth decay for people of all ages; for every dollar spent on fluoridation, there is about a $38 benefit in better oral health.[122] This may vary depending on the water distribution system. Over four million people in 140 Massachusetts communities in 2014 had the health and economic benefits of CWF (see figure). However, Massachusetts ranked 37th in the nation with respect to CWF at the end of 2014: only about 62% of the state's population on a public water supply had CWF, compared to 74.4% for the United States.[123,124] The Healthy People 2020 national goal is 79.6%.

Most of the fluoridated communities in Massachusetts are in the eastern part of the state, with few fluoridated communities in western Massachusetts or Cape Cod (see figure on the following page). Of the 25 largest cities and towns in our state, all have CWF except five communities — Barnstable, Brockton, Chicopee, Worcester, and Springfield — with a total population of 529,602.[125] In 2016, Brockton reordered fluoridation, but it has not yet been implemented.

In 2014 and 2015, CWF was questioned or challenged in at least 13 communities with a total population of over 310,000 residents, either at a board of health meeting, at a town meeting, or by referendum; all were defeated. In 2016, there were at least three challenges; all were defeated in Town Meeting. Unfortunately, these challenges are due to misinformation and inaccurate science, which are much more abundant on the Internet and social media than credible sources.[126] Local boards of health in both fluoridated and non-fluoridated communities need to be better informed of the benefits of CWF; in a 2010 survey of local boards of health without CWF, 74% of respondents did

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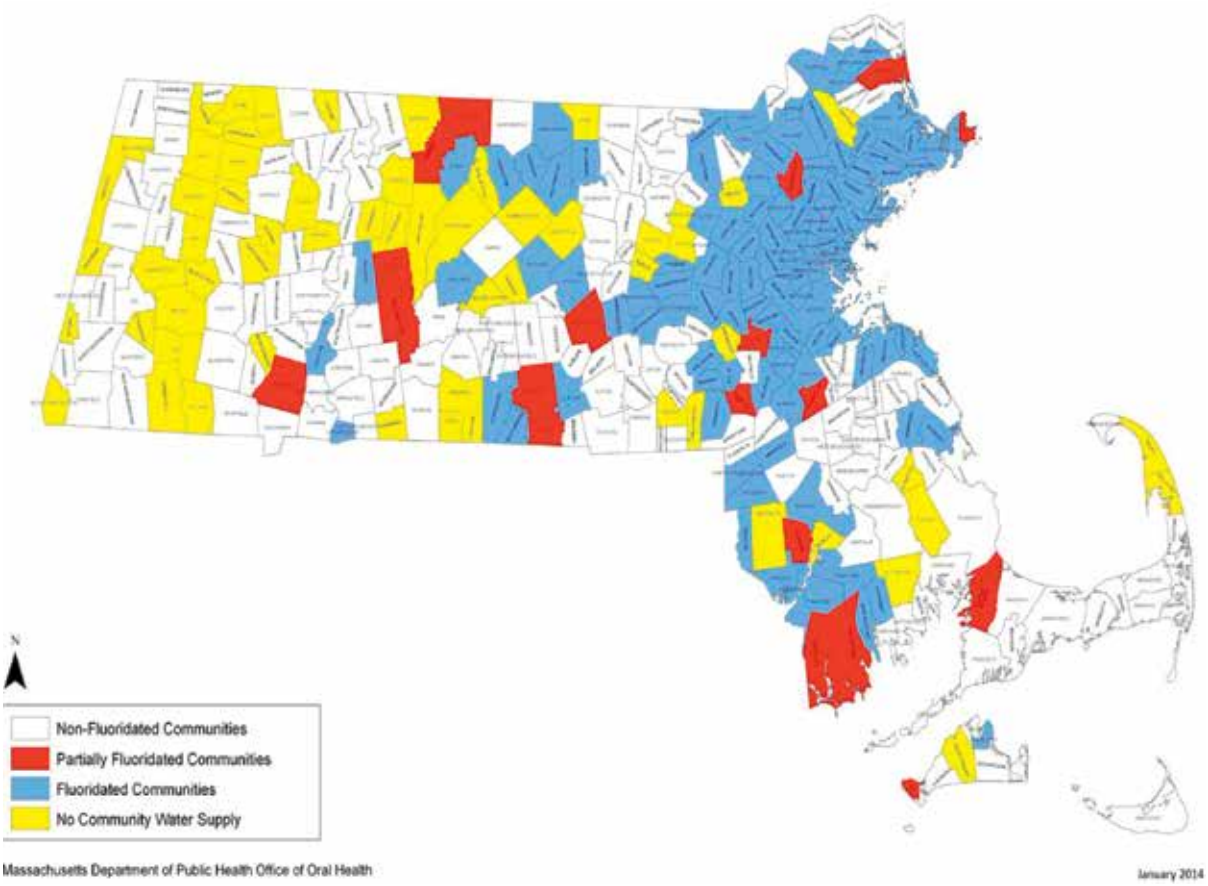
[119]Health Policy Commission Policy Brief. *Oral health care access and emergency department utilization for avoidable oral health conditions in Massachusetts*. August 2016.
[120]Health Policy Commission Policy Brief. *Oral health care access and emergency department utilization for avoidable oral health conditions in Massachusetts*. August 2016.
[121]ADA Health Policy Institute. *Oral health care system: Massachusetts*. www.ada.org/en/~/media/ADA/Science%20and%20Research/HPI/OralHealthCare-StateFacts/Massachusetts-Oral-Health-Care-System.ashx. 2015
[122]Griffin SO, Jones K, and Tomar SL. An economic evaluation of community water fluoridation. *J Publ Health Dent*. 2001; 61(2): 78–86.
[123]Allukian M, Wong C. Fluoridation update 2014. *J Mass Dental Soc*. 2014; 63(2): 24–30.
[124]Division of Oral Health, National Center for Chronic Disease Prevention and Health Promo. *Fluoridation Statistics*. www.cdc.gov/fluoridation/statistics/2014stats.htm. Published 2016. Accessed November 14, 2016.
[125]Allukian M, Wong C. Fluoridation update 2014. *J Mass Dental Soc*. 2014; 63(2): 24–30.
[126]Mertz A, Allukian M. Community water fluoridation on the Internet and social media. *J Mass Dental Soc*. 2014; 63(2): 32–36.

not know that CWF was the most cost-effective program for preventing tooth decay.[127] In 2015, the U.S. Department of Health and Human Services changed the recommended fluoride level for water supplies from 0.7–1.2 ppm (parts per million) to 0.7 ppm because recent studies showed that water intake of fluoride is the same regardless of mean annual temperature and a range is not necessary. Opponents of fluoridation have used this proposed change to challenge CWF.[128,129]

Commonwealth of Massachusetts Fluoridation Status



Reputable scientific studies and reports continue to show that CWF is the most cost effective measure for preventing tooth decay.[130,131] The quality of CWF in Massachusetts communities that do fluoridate has been excellent; beginning in 2006, Massachusetts received the State Fluoridation Quality Award eight years in a row.

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[127]Bhatt V, Allukian M, *A survey of the knowledge and interests in dental prevention programs of Massachusetts local boards of health in non-fluoridated communitie*s (Unpublished study). Boston, MA; 2010.
[128]Allukian M, Wong C. Fluoridation update 2014. *J Mass Dental Soc.* 2014; 63(2): 24–30.
[129]Gooch B, Goodman J, Gracia JN, Griffin SO, Grummer-Strawn L, Hirschman J, Makrides NS. U.S. public health service recommendation for fluoride concentration in drinking water for the prevention of dental caries. *Public Health Reports.* 2015; 130 (4), 318–331.
[130]Gooch B, Goodman J, Gracia JN, Griffin SO, Grummer-Strawn L, Hirschman J, Makrides NS. U.S. public health service recommendation for fluoride concentration in drinking water for the prevention of dental caries. *Public Health Reports.* 2015; 130 (4), 318–331.
[131]Public Health England. *Water fluoridation*. Health monitoring report for England 2014, London, England: Wellington House; March, 2014.

MassHealth Coverage and Safety Net Providers

Access to dental services for vulnerable population, especially adults, has frequently depended on whether MassHealth covered these services and safety net providers are available. Coverage has fluctuated at times. In 2010, adult dental coverage for MassHealth members aged 21 or older was eliminated except for cleanings and extractions.[132] As a result, community health centers saw a dramatic increase in the number of emergency adult dental patients. In 2012, MassHealth restored adult dental coverage for white fillings in front teeth, and for fillings in all teeth in 2014. Coverage for complete dentures was restored in 2015. The dental program was only about 2.31% ($264 million) of the $11.4 billion MassHealth budget in 2015.[133]

The primary dental safety net in Massachusetts consists of approximately 53 community health center dental program sites and satellites, which had about 600,000 patient visits in 2013. They are usually stretched beyond their capacity due to the increase in the number of MassHealth members, the great unmet need of vulnerable populations because a limited number of private practitioners treat MassHealth patients. Many of these health center dental programs need financial support to expand, improve efficiency, and make better use of support personnel. In FY 2015, only 1,695 MassHealth dentists were active providers (i.e., billed more than $10,000 a year); this was an 18% increase since FY 2013. However, this represents only about 24% of dentists licensed in Massachusetts. Unfortunately, only 53.9% of MassHealth children had a dental visit, but only 16.8% received restorative treatment and basic dental care in 2015 — an indication of the need for much better access to care for MassHealth children.[134]

Fluoride Varnish and the Medical Workplace

Topical fluoride varnish application is an effective measure for preventing tooth decay. In April 2012, the Massachusetts Department of Public Health began to allow non-licensed individuals such as medical assistants to administer fluoride varnish under the supervision of a licensed physician or nurse to patients between the ages of 6 months to 21 years, and included MassHealth reimbursement for the services. In 2015, MassHealth added the CPT service code for fluoride varnish for non-dental providers. These changes improved access to fluoride varnish for high-risk children, who often do not see a dental professional on a regular basis.

[132]Goodenough A. Sharp cuts in dental coverage for adults on medicaid. *New York Times*. August 28, 2012.
[133]Seifert R. *Personal communication*. October 6, 2016.
[134]Seifert R. *Personal communication*. October 6, 2016.

In 2015, 11,810 MassHealth members received this service in a medical office, a 60.72% increase from 5,738 members by 149 medical providers in 2013.[135] Fluoride varnish should be included by third-party insurers as a benefit for all members, including children and adults. Fluoride varnish should also be promoted on an ongoing basis to the medical profession.

Oral Health Practice Guidelines for Pregnancy and Early Childhood

Pregnant women have generally been less likely to utilize dental care during than before pregnancy. In Massachusetts in 2014, 53.2% of White women had a dental cleaning during pregnancy, compared to only 32.7% for Black women and 37.9% and 38.1% for Hispanic and Asian women respectively.[136] The Massachusetts Department of Public Health (MDPH), through an oral health advisory group, formulated oral health care practice guidelines for providers who care for pregnant women and young children. These guidelines include detailed information for medical providers on how to assess oral health status and offers advice on the importance of oral health and dental care. Recommendations were included for dental providers and guidelines for pediatricians on oral assessment for young children and how to treat children with special needs. Oral health risk assessment tools, facts about fluoride use, and benefits of community water fluoridation are also documented. The purpose of this document is to present in one place all the information necessary to educate providers about dental care for pregnant women and young children, and to improve access to dental care for this vulnerable population.[137]

Public Health Dental Hygienists

In 2009, Massachusetts passed a law that allowed dental hygienists who had received additional training and had a written collaborative agreement with a licensed dentist to work without supervision in public health settings and to receive MassHealth reimbursement. The goal was to increase access to preventive services for high risk populations. Over 6,500 hygienists were licensed in Massachusetts in 2011, and of those responding to a statewide survey, 30% indicated they were likely to practice as a public health dental hygienist in the next five years.[138] However in FY 2014, only 33 public health hygienists provided services to 9,000 residents, receiving $1.3 million in MassHealth reimbursements and $1.57 million in FY 2015. About half of the residents were school age; very few were residents of nursing homes.[139] The law, although a step in the right direction, has had a limited impact for a variety of reasons: it does not allow reimbursement by self-payers or other third party insurers, it limits services to those provided by hygienists in private practice, and it requires hygienists to have three years of prior clinical experience. Also, it does not include incentives or programs to encourage hygienists to work with vulnerable populations, especially seniors. In addition, requirements imposed by the State Dental Board have increased the barriers to becoming a public health hygienist.

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[135]Seifert R. *Personal communication*. October 6, 2016.
[136]Massachusetts Department of Public Health. *Massachusetts PRAMS 2011 surveillance report*. www.mass.gov/eohhs/docs/dph/ com-health/prego-newborn/prams-report-2011.pdf. June 2015: 86-88.
[137]*Massachusetts oral health practice guidelines for pregnancy and early childhood*. www.mass.gov/eohhs/docs/dph/com-health/data-translation/oral-health-guidelines.pdf.
[138]Massachusetts Department of Public Health. Health professions data series dental hygienists 2011. April 2013.
[139]Martin B. *Public Health Dental Hygienists A Massachusetts Success*. University of Massachusetts Medical School, Commonwealth Medicine Office of Clinical Affairs. May 30, 2014.

Advanced Dental Hygiene Practitioner (ADHP)

In the 2016 legislative session, Bill S.2076, "An Act Establishing a Dental Hygiene Practitioner Level of Practice," was filed to change the state practice act to allow a dental hygienist to become an advanced dental hygiene practitioner (ADHP) allowing them to drill and fill teeth and do simple extractions under the general supervision of a licensed dentist. Dental therapists, who have similar training though usually for only two years, have been used successfully in about 52 countries where they can drill and fill teeth.

S.2076 allows additional training for hygienists to do the same procedures. Though a training program of 12 to 18 months and a 500-hour or one-year clinical preceptorship must be first completed. The ADHP would improve dental access and lower the cost of dental care for many Massachusetts residents. The bill was unanimously passed by the state Senate and went to a conference committee after the bill faltered in the Joint Committee on Health Care Financing. The ADHP bill was then included in the draft 2017 state budget, but unfortunately was not included in the final budget.

Future drafts of this bill should remove some of the limitations that were in the public health hygienist law, and the ADHP should be required to have at least 10% of their patients be MassHealth members.

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Center for Medicaid and CHIP Services. *FFY 2015 number of children ever-enrolled in Medicaid and CHIP.* https://www.medicaid.gov/chip/downloads/fy-2015-childrens-enrollment-report.pdf.

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U.S. Department of Health and Human Services, Health Resources and Services Administration. *Designated health professional shortage areas statistics.* http://datawarehouse.hrsa.gov/Tools/quickreports.aspx. Published January 1, 2016.

Massachusetts Department of Public Health, Office of Oral Health. *The status of oral disease in Massachusetts: A Great Unmet Need.* www.mass.gov/eohhs/docs/dph/com-health/oral-health-burden.pdf. Boston; 2009.

Bureau of Clinician Recruitment and Service, Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services, HRSA Data Warehouse: Designated Health Professional Shortage Areas Statistics, as of September 9, 2016.

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Griffin SO, Jones K, and Tomar SL. An economic evaluation of community water fluoridation. *J Publ Health Dent.* 2001; 61(2): 78–86.

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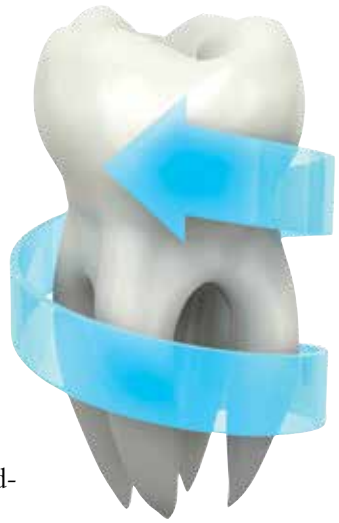
Policy Perspective

In 2017, we have a new president and the new 115th Congress so the future of the public's health, the Affordability Care Act, the Children's Health Insurance Program (CHIP), and federal funding for Medicaid as well as other federally funded programs have a very uncertain future. It is more important than ever before that we work together to protect federal and state funding with the best evidence possible to ensure we don't move backward. Massachusetts is in a unique but vulnerable position. It will be challenging for us from this point on.

Some Recommendations for Better Oral Health



Oral health must be better integrated with primary health and general health in practice systems as well as be a much higher priority in the development and implementation of all health policies and programs, especially for vulnerable and underserved populations. In order to achieve better oral health for all, the following are recommended:

1. The MDPH's Office of Oral Health needs to be better funded and staffed to respond to the great unmet needs of Massachusetts residents. The MDPH should integrate oral health into their other programs as they did with Maternal and Child Health and Health Equity.
   - A Dental Public Health Advisory Committee with recognized experts in dental public health should be implemented once again to provide guidance and additional resources to the MDPH.
   - The MDPH should reinstitute their Senior Oral Health Advisory Committee. A statewide strategy needs to be developed and implemented to respond to the great unmet oral health needs of seniors, especially the homebound and those in long-term care facilities.
   - The MDPH should update its 2009 Status of Oral Disease in Massachusetts and do a statewide inventory of all community dental programs. The oral health status of all age groups and vulnerable populations needs to be assessed periodically by the MDPH to help direct scarce resources and include an interface with chronic disease surveillance.
2. CWF must be the foundation for improving the oral health of every community in our state, as tooth decay eventually affects almost everyone. CWF is the most cost-effective prevention measure for one of the most common diseases in Massachusetts, and it should be the highest priority to improve oral health in our state. As Massachusetts is ranked 37th in the United States and only 63% fluoridated with at least 23 challenges in the last few years, the following needs to be done:
   - The MDPH needs to make fluoridation and population-based prevention a much higher priority. More assistance needs to be provided to local boards of health and other organizations, institutions, and agencies on fluoridation and other population-based prevention measures and programs.
   - The health, public health, and dental communities should urge and help Brockton's leadership to implement CWF. Brockton, a community of 93,810 ordered CWF in 2016, but it has not yet been implemented.
   - Organized dentistry and dental hygiene must play a much stronger role in educating the public, community leaders and their members to educate their patients and communities about the safety and benefits of fluoridation in both fluoridated and non-fluoridated communities.
   - Dental schools, dental hygiene, and dental assistant schools should have their students learn and talk about the safety and benefits of fluoridation with their patients and communities on a regular basis.

- In non-fluoridated high-risk communities, school fluoride rinse/tablet/varnish programs are recommended. In 2015, there were only 36,000 children participating in these programs a 10% decrease since 2014. This needs to be addressed.
- School-based sealant prevention programs for high-risk children ages 6–8 and 12–14 years old also need to be documented and promoted statewide for preventing tooth decay on the biting surfaces of the 6-year and 12-year molars, which are most susceptible to tooth decay. The MDPH should do an inventory of these programs.

3. A sugar drink tax is needed in Massachusetts. The link between high sugar intake and obesity, diabetes, and tooth decay is well documented. A tax will help reduce sugar consumption and provide new financial resources to support and promote public health and oral health programs.
4. Community and professional organizations, leaders, decision makers, local boards of health, and the public must be better informed and educated about the importance of oral health, population-based prevention programs and services, and vulnerable populations, with all of them working together to improve oral health for all residents in Massachusetts.
5. More dentists and hygienists need to become members of their local boards of health or play a more active role in their community.
6. The number of dentists actively treating MassHealth patients needs to be increased so that a higher percentage of children will receive treatment.
7. Fluoride varnish needs to be included as a benefit for seniors and children by all third-party health insurers and be continuously promoted to the medical profession
8. The use of public health dental hygienists must be supported and encouraged for population-based prevention programs in high-risk communities and especially for homebound seniors and those in extended care facilities. There also needs to be fewer restrictions and some incentives for one to become a public health hygienist.
9. The ADHP bill should be resubmitted removing some of the limitations in the public hygienist law and adding that at least 10% of their patients be MassHealth.

Myron Allukian Jr., DDS, MPH
President
Massachusetts Coalition for Oral Health

Policy Perspective

Oral health is an integral component of health. Including oral health as a key component of patient-centered care delivery and finance models is an important way to assure that oral health is fully integrated into health. The Affordable Care Act (ACA), in addition to providing access to health benefits for millions, includes provisions that support that integration, through models such as accountable care organizations (ACO). The ACA and a general movement toward patient-centered health care systems that focus on improving health outcomes, rather than numbers of encounters, show great promise in promoting and supporting improved and effective health care. MassHealth is currently undertaking pilots within the state to move toward an ACO model. It will be important that oral health is addressed in pilots as soon as possible to assure that MassHealth members can have access to a MassHealth ACO that includes total health.

As the new administration in Washington threatens to change the trajectory of the momentum toward continued implementation of the ACA, it will remain important for advocates for oral health to continue to move us toward integration of oral health into health by participating in the prevailing public discourse about the health care system and promoting the importance of oral health as health issue.

Michael Monopoli, DMD, MPH, MS
Vice President, Foundation Programs
DentaQuest Foundation

ADDITIONAL INFORMATION ABOUT FLUORIDATION

U.S Centers for Disease Control and Prevention (CDC):
www.cdc.gov/fluoridation

American-Dental-Association (ADA):
www.ada.org/~/media/ADA/Member%20Center/FIles/fluoridation_facts.ashx

Massachusetts Department of Public Health (MDPH):
www.mass.gov/eohhs/gov/departments/dph/programs/community-health/oral-health/community-water-fluoridation.html

American Academy of Pediatrics (AAP):
www.ilikemyteeth.org

American Fluoridation Society:
http://americanfluoridtionsociety.org

MASSACHUSETTS
MEDICAL SOCIETY

Every physician matters,
each patient counts.