

# Health of Massachusetts

**Deval L. Patrick** Governor  
Commonwealth of Massachusetts

**Timothy P. Murray** Lt. Governor  
Commonwealth of Massachusetts

**JudyAnn Bigby, MD** Secretary  
Executive Office of Health and Human Services

**John Auerbach** Commissioner  
Massachusetts Department of Public Health

## **Health of Massachusetts**

April 2010

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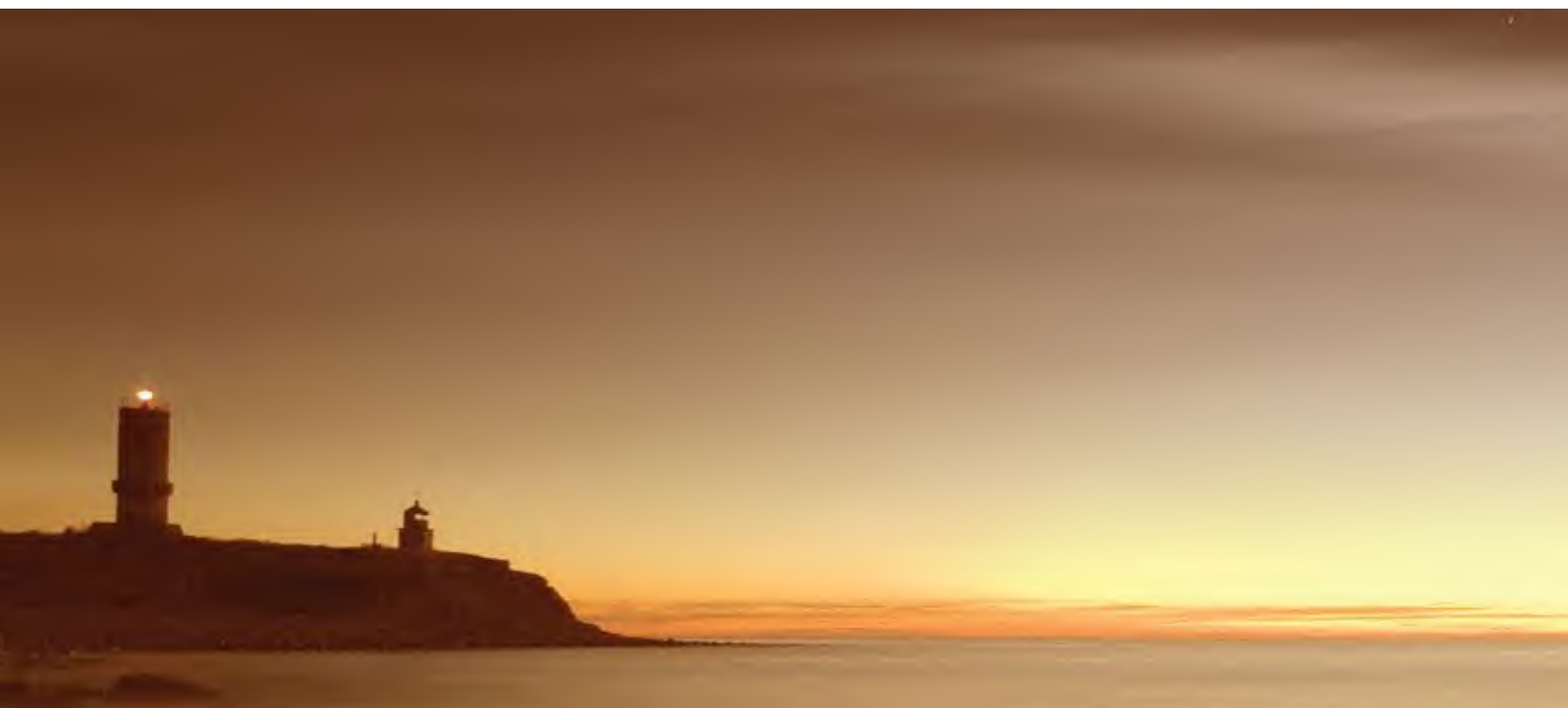
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# Letter from the Commissioner



Dear Friends:

Welcome to the Massachusetts Department of Public Health: *Health of Massachusetts*. This new report represents a major leap forward in our ability to provide useful data on the health of Massachusetts residents, in an easy-to-understand and accessible format. For the first time, we have coupled statistical information with policy perspectives from some of the leading experts in the field of public health, allowing for greater context in understanding the broad issues we face.

This report reflects the dedication and commitment of state and local public health departments across Massachusetts, and the community partnerships that sustain those efforts. The data in these pages form the basis of all these activities, and helps us identify our priorities and target our efforts.

In so many ways, Massachusetts is a public health leader. Our programs and initiatives are wide-ranging and forward-thinking.





The health of our residents is better than national averages in many areas. And we lead the country in providing health care coverage to our residents because of our landmark health care reform legislation.

Still, many challenges remain: reducing the burden of obesity and its related conditions, addressing racial and ethnic health disparities, ensuring the success of health care reform, managing chronic disease and supporting local public health across the state. With the publication of *Health of Massachusetts*, we take stock of where we stand in facing these and other challenges — and more important, where we need to go next.

Sincerely,

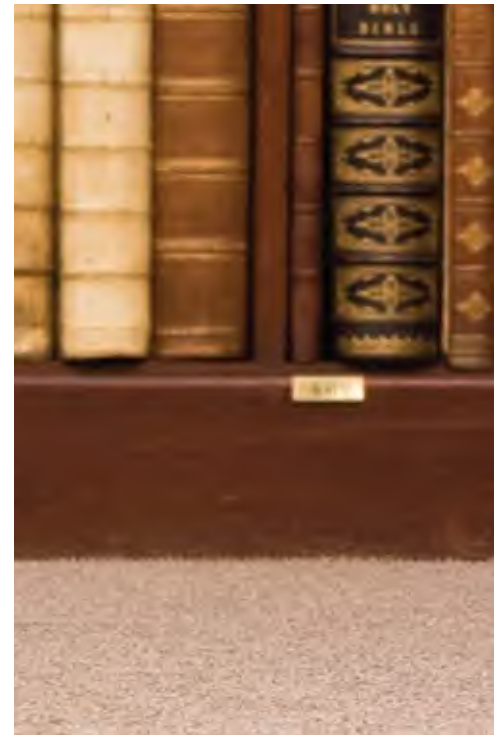


John Auerbach  
Commissioner





# Preface



One of the primary activities and goals of the Massachusetts Department of Public Health is the analysis and wide distribution of health data. This takes the form of dozens of publications published annually throughout the Department. *Health of Massachusetts* is the first report to bring all those sources of data “under one roof”. This compilation of more than fifty data sources gives the reader the “big picture” view of health in the Commonwealth of Massachusetts.

The Department of Public Health annually publishes dozens of data reports, fact sheets and bulletins. If you are looking for more detailed data, go to [www.mass.gov/dph/publications](http://www.mass.gov/dph/publications) for a current list of our reports.

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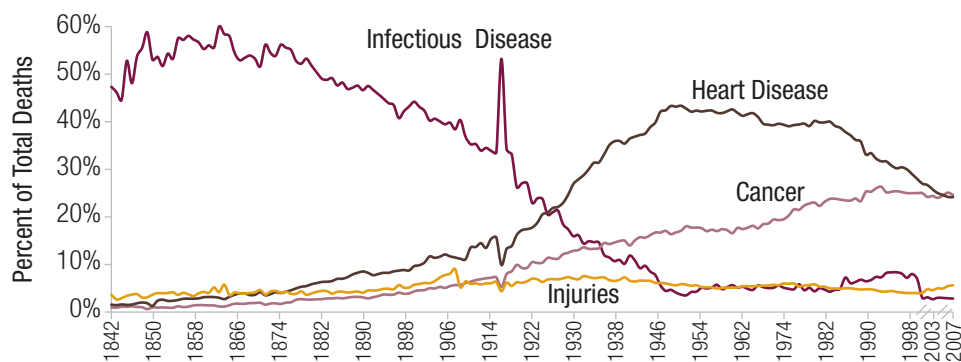
## About This Report

MDPH has been collecting and using data to inform policy makers and the public since 1842, the year the first statewide registration of vital records began. Since then, DPH has implemented many interventions which brought about huge reductions in death from infectious disease, tracked the emergence of heart disease and cancer as the most prevalent

Public health offers a practical, goal-oriented, and community-based approach to promoting and maintaining health. To identify problems and develop solutions for entire population groups, the public health approach<sup>1</sup>:

- » Defines the problem, using surveillance processes designed to gather data that establish the nature of the problem and the trends in its incidence and prevalence;
- » Identifies potential causes through epidemiological analyses that identify risk and protective factors associated with the problem;
- » Designs, develops, and evaluates the effectiveness and generalizability of interventions; and
- » Disseminates successful models as part of a coordinated effort to educate and reach out to the public.

Figure A: Cause of Death in Massachusetts, 1842-2007



Source: MDPH, Division of Research and Epidemiology.

causes of death today, and studied the causes and treatment of newly emerging diseases, such as HIV/AIDS, Lyme disease, H1N1, and others.

We begin this report by describing the Massachusetts population (Chapter 1) and the community assets that improve the quality of our lives (Chapter 2).

Chapter 3 provides our most recent analysis of the impact of Health Care Reform legislation, and focuses on access to health care.

Chapter 4 shows the ways in which we guarantee the quality and safety of that care.

Chapters 5 through 7 focuses on life span health issues, from perinatal and childhood issues in Chapter 5 to infectious diseases in Chapter 6 and wellness and chronic diseases in Chapter 7.

Chapters 8 and 9 focus on the places where we live and work, with discussions of environmental health and occupational health.

Chapters 9 through 13 provide information about risk behaviors that lead to harm and serious and fatal events: substance abuse, injuries, suicide, and homicide.

The report concludes with a summary of causes of death in Chapter 14.

The Appendix contains a contact list for the Department and data sources used in this report.

Each chapter examines trends over time to see where improvements have occurred and where health issues remain, identifying race, ethnicity, and

<sup>1</sup> As cited in Youth Violence: A Report of the Surgeon General, January 2001.

[http://mentalhealth.samhsa.gov/cre/ch1\\_pub\\_health\\_approach.asp](http://mentalhealth.samhsa.gov/cre/ch1_pub_health_approach.asp). Accessed January 28, 2010.

geographic disparities in order help us better target our programs to communities with the greatest needs. They also track emerging issues so that we can prepare to address new public health problems.

Many chapters contain Policy Perspectives, written by outside experts from the community, advocacy groups, and local universities. These comment on key issues and often suggest crucial steps needed to address these issues in order to protect the health of the Commonwealth. Finally, each chapter ends with references and detailed information about certain charts and graphs.

**This document summarizes  
the issues affecting the  
health of the people of  
Massachusetts, and the  
MDPH activities that  
address these issues.**

---

## **Notes to the Reader**

### **Charts, Sources and Figure Notes**

All charts, tables, maps or other representations of data are called “Figures” in *Health of Massachusetts*. Within the figure, information is given on the source of the data and when applicable, whether the data shown have statistically significant differences. More information on the figures (including definitions or clarifying information) may be included at the end of the chapter under “Figure Notes.”

### **Technical Language**

Every effort was made with this report to use plain language whenever possible, but technical language is necessary in certain cases. Terms such as “age-adjusted”, “amenable mortality”, “confidence intervals”, “premature mortality”, “Healthy People 2010”, “ICD”, and “life expectancy are examples of these kinds of terms. Many of these terms are defined near the text, in the endnotes or in the data sources section (located in the Appendix).

### **Abbreviations**

Common abbreviations used in this report include:

BRFSS: Behavioral Risk Factor Surveillance System. This is a common data source used throughout *Health of Massachusetts*. It is conducted both at the federal level and here in Massachusetts by the Department of Public Health. For more information on this survey, see Data Sources in the Appendix.

CDC: US Centers for Disease Control and Prevention

MDPH: Massachusetts Department of Public Health

YRBS: Youth Risk Behavior Survey. This survey is also conducted at the state and federal level. For more information on the YRBS, see Data Sources in the Appendix.

### **Race and Ethnicity**

We use the following mutually exclusive categories: White, Black, American Indian, Asian, and Hispanic. The Hispanic category includes persons

of Hispanic ethnicity regardless of their race. The full expression of these categories is White Non-Hispanic, Black Non-Hispanic, American Indian Non-Hispanic, Asian Non-Hispanic, and Hispanic.

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## Acknowledgements

The Department's extensive data collection, surveillance, monitoring, research, and analysis activities form the basis of this report. Dozens of Bureaus and Divisions within the Department contributed to this effort. We thank the many people who contributed data and strategic direction for this report.

Overall responsibility for planning and coordinating *Health of Massachusetts* rested with the Commissioner's Office under the direction of Kristin Golden, Director of Policy and Planning and the Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research and Evaluation under the direction of Bruce Cohen, Director.

Day to day coordination of *Health of Massachusetts* and data analysis was done by Isabel Cáceres, Malena Hood and James K. West.

Creative direction and design was executed by Sheila Erimez with graphic support by Donald Poulsen. Writing and editing services were provided by Cathy Corcoran.

Each chapter of *Health of Massachusetts* was managed by a team of content experts within the Massachusetts Department of Public Health. They analyzed data and wrote the narrative and include:

**Bureau of Community Health Access and Promotion (Jewel Mullen, Director):** Anita Albright, Cheryl Bartlett, Brianne Beagan, Lynn Bethel, Maria Bettencourt, Joan Bohlke, Katrina D'Amore, Julia Dyck, Christine Farrell-O'Reilly, Kathleen Fitzsimmons, Kathy Foell, Holly Hackman, Alan Holmlund, Carrie Huisinck, Donna Johnson, Cynthia Lamond, Leonard Lee, Terri Mendoza, Gail Merriam, Solomon Mezgebu, Monika Mitra, Vera Mouradian, Joshua Nyambose, June O'Neill, Wee Lock Ooi, Paul Oppedisano, Carlene Pavlos, Becky Sarah, Paul Tessier, Lionel White, Jean Zotter

**Bureau of Environmental Health (Suzanne Condon, Director):**  
Jan Sullivan

**Bureau of Family Health and Nutrition (Ron Benham, Director):**  
Marlene Anderka, Rachel Colchamiro, Carol Davin, Rashmi Dayalu, Karin Downs, Jane Dvorak, Roger Eaton, Janet Farrell, Patti Fougere, Judy Hause, Emily Lu, Susan Manning, Tracy Osbahr

**Bureau of Health Care Safety and Quality (Alice Bonner, Director):**

Elizabeth Daake, Sherman Lohnes, Eileen McHale, Philip Mello, Jean Pontikas

**Bureau of Health Information, Statistics, Research and Evaluation**

**(Jerry O’Keefe, Director):** Bonnie Andrews, Lenore Azaroff, Isabel Cáceres, Bruce Cohen, Letitia Davis, Michael Fiore, Kathleen Grattan, Helen Hawk, Malena Hood, Beth Hume, Lauren Kievits, James Laing, Angela Laramie, Maria McKenna, Beatriz Pazos, Elise Pechter, Vivian Pun, Liane Tinsley, James K. West

**Bureau of Infectious Disease (Kevin Cranston, Director):**

Alfred DeMaria, Ceci Dunn, Gillian Haney, Deborah Isenberg

**Bureau of Substance Abuse Services (Michael Botticelli, Director):**

Hermik Babakhanlou-Chase, Andrew Hanchett, Hilary Jacobs, Steve Keel, Lois Keithly, Thomas Land, Kyle Marshall, Mark Paskowsky, Karen Pressman, Sarah Ruiz, Eileen Sullivan, Jennifer Tracey

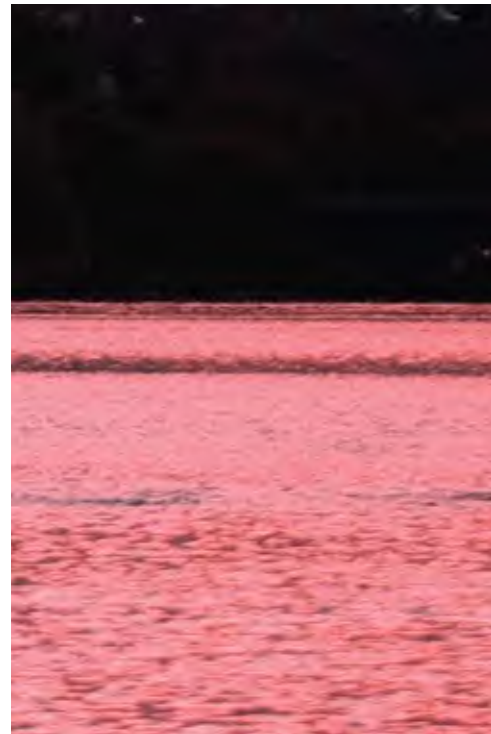
We extend enormous gratitude to the many experts in their fields who provide guest commentary through the Policy Perspectives at the end of most chapters.

We also acknowledge the data stewards who collect, verify, clean and produce the data used in this report.





# About Us



Public health is a community-wide commitment to health for every individual. Using a wide variety of approaches including education, inspections, screenings, services, regulations, research and the provision of funding to numerous local programs and interventions, the Massachusetts Department of Public Health works to make sure that all six and one-half million Massachusetts residents are “healthy people leading healthy lives in healthy communities.”

The history of public health in Massachusetts is long and prestigious. During the 1700’s, the smallpox inoculation was pioneered, the first pure food legislation was enacted, the first public clinics were opened, and Paul Revere chaired the Boston Board of Health. Since then, the public health system has provided critical services that protect and enhance the health of all residents of the Commonwealth.

Today, the Massachusetts Department of Public Health continues this legacy by:

- Providing outcome-driven, evidence-based programs to promote wellness, prevent and control disease and disability through the management of state and federal resources.

## **Mission Statement**

The Massachusetts Department of Public Health is dedicated to the mission of *helping people lead healthy lives in healthy communities.*

### **Ten Great Public Health Achievements:**

- » Vaccination
- » Motor-vehicle safety
- » Safer workplaces
- » Control of infectious diseases
- » Decline in deaths from coronary heart disease and stroke
- » Safer and healthier foods
- » Healthier mothers and babies
- » Family planning
- » Fluoridation of drinking water
- » Recognition of tobacco use as a health hazard

Source: Centers for Disease Control and Prevention. Ten great public health achievements – United States, 1900-1999. MMWR. 1999;48:241-3.

- Operating four public health hospitals, the Hinton State Laboratory Institute, and the State Office of Pharmacy Services.
- Collecting, maintaining, and publishing vital records and health statistics
- Licensing, certifying, and/or accrediting hospitals, clinics, laboratories, and thousands of health professionals.
- Interpreting and enforcing public health law.
- Providing surveillance of chronic diseases, occupational hazards, injuries, behavioral risks, and other indicators of public health issues.
- Providing 24/7 coverage to detect, prevent, and resolve infectious, environmental, and bio-terrorism threats to the health of the public.

Dedicated DPH staff work at more than twenty different locations across the state. Their duties are diverse: doctors, nurses, and other health providers care for patients at the four public health hospitals; epidemiologists track diseases and investigate clusters of illness; inspectors protect the public by enforcing public health laws; administrators provide guidance to more than 700 community-based agencies that receive funding from the Department; educators and outreach workers enroll clients in WIC and Early Intervention; and laboratory workers identify and track strains of illness across the state.

The success of our efforts to promote public health would not be possible without our many partners. The Massachusetts Department of Public Health benefits greatly from its fifteen-member Public Health Council. We value the leadership and support that we receive from the members of the Massachusetts Legislature. We are grateful for collaborations with other state and federal agencies, and with the 351 local Massachusetts boards of health. Our network of more than 700 community-based health and human service providers and thousands more dedicated public health professionals help us realize our public health goals across the Commonwealth.

### **Strategic Priorities**

The Massachusetts Department of Public Health has worked hard in recent years to identify its overarching strategic priorities, allowing us to focus our efforts, identify policy opportunities and improve results.

These priorities were developed collaboratively in 2007 with input from hundreds of residents, stakeholders and community partners who attended regional meetings around the state. These goals reflect the issues that define public health in the 21<sup>st</sup> century.

In its programs and policies, the Massachusetts Department of Public Health is committed to:

- Ensuring the success of Health Care Reform.
- Eliminating racial and ethnic health disparities.
- Promoting wellness in the workplace, school, community and home.
- Managing chronic disease.
- Building public health capacity at the local and state levels.





# D Demographics and Socio-Economics



Who we are is an integral component of what makes us healthy. In terms of demographic make up, Massachusetts has several characteristics that support a healthy community. On the plus side, we are incredibly educated – we have the highest percentage of college graduates in the country. In sheer dollars and cents, we make more than most of our fellow Americans. We are rich in diversity with 25% of residents being immigrants or racial minorities or both.

Demographic information is also necessary to plan for the public health and medical systems of tomorrow. We must be cognizant of an aging population, the prevalence of disability, and the thousands of people who speak different languages.

Who are the residents of Massachusetts? How many are they, and what are the social and economic conditions of their lives? This chapter attempts to provide some answers to these questions.

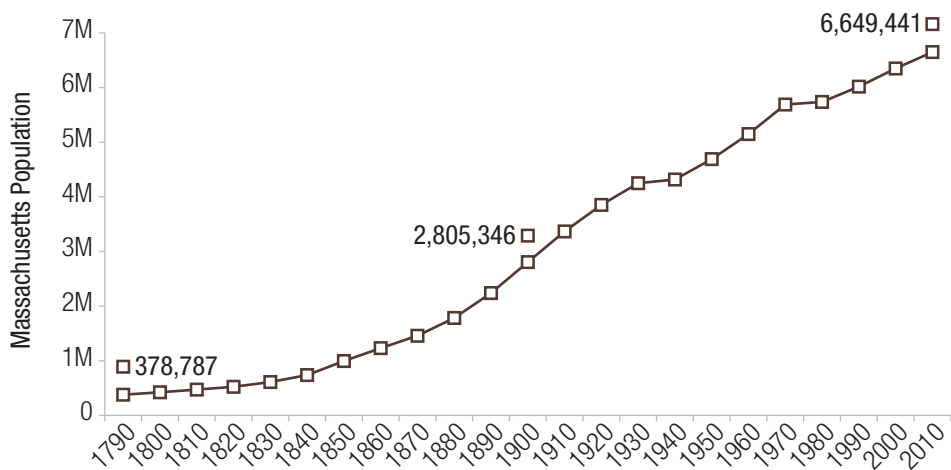
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## Population

Massachusetts is the third most densely populated state in the nation and it ranks 14<sup>th</sup> in population count.<sup>1</sup> Massachusetts has more than six

and one-half million people. Its population has risen with each Census since 1790. The fastest rate of growth was from 1830 to 1910 when the population grew from 600,000 to 3.4 million (Figure 1.1). Although the population continued to rise after 1910, the rate of growth slowed to less than one-half a percent per year after 1970. In recent years, international migration into the state and births to foreign-born mothers have nearly offset the migration out of the state.

Figure 1.1 Massachusetts Population from 1790 to 2010

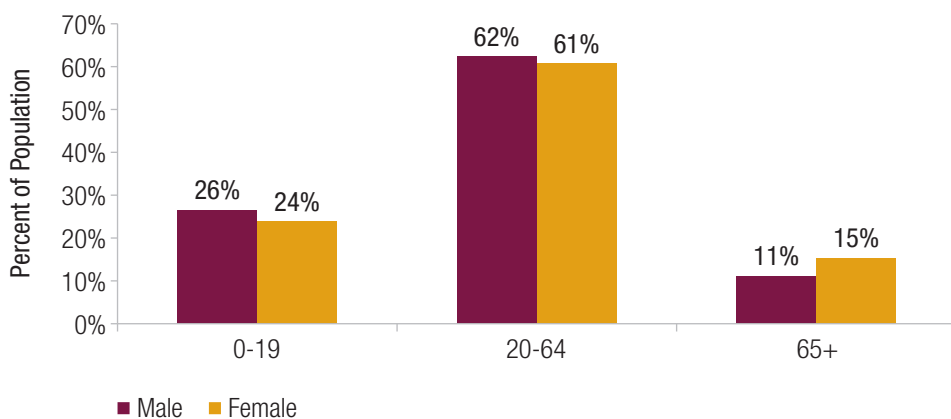


Source: US Census Bureau, Population Division.

Gender

Women are the majority of the Massachusetts population at 52%. Unlike the United States, in which there were more men than women until

Figure 1.2 Male and Female Population by Age



Source: CDC National Center for Health Statistics.



1950, there have always been more women than men in the state. There are more males than females from birth to age 19. For the middle age group of 20 to 64, and the oldest group, 65-plus there are more women than there are men. Women outnumber men 2.4 to 1 among those ages 85 plus.

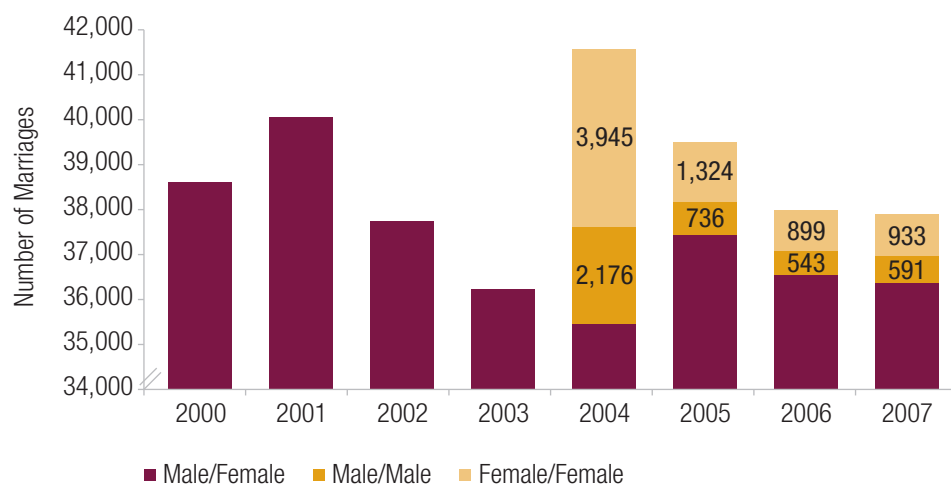
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## Marital Status

Marriage rates have declined since the 1980s, and the percentage of residents who have never married is growing. In 2008, one in three women and two out of five men has never married. These rates are twice what they were in 2000. The marriage rate had a one-year increase to 6.5 per 1,000 population in 2004 when same-sex marriage was legalized, but before that and more recently, it has been around 5.5 per 1,000. In May 2004, Massachusetts became the first state in the United States to legalize same-sex marriage. From May 2004 through the end of 2007, there have been more than 11,000 same-sex marriages.

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Figure 1.3 **Marriages Since 2000**



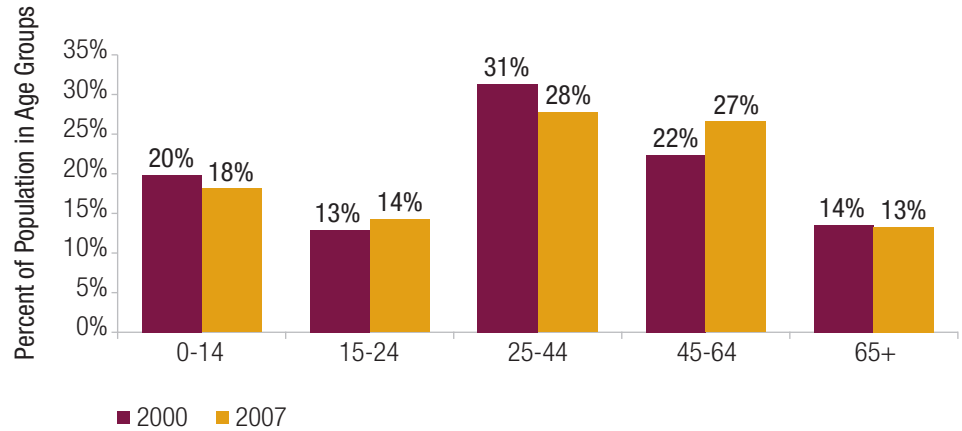
Source: MDPH Marriage File, 2000-2007.

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## Age

The state's population is aging with almost one-third of residents 50 or older. In 2000, the average age was 36.9 years, and in 2007, it has risen to 38 years. Since 2000, the numbers of children ages 0-14 and adults ages 25 to 44 have decreased. There have been increases in young adults ages 15 to 24 and adults ages 45 to 64, and an increase in the oldest old, adults 85 years or more. Massachusetts ranks 9<sup>th</sup> among states in percentage of the population over 85.

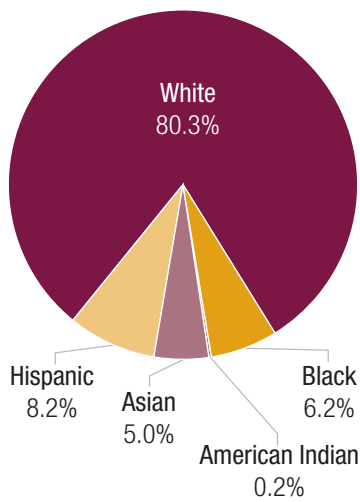
Figure 1.4 Population by Age Groups



Source: CDC National Center for Health Statistics.

\*All 2007 age group percentages are statistically different from 2000 percentages ( $p \leq 0.05$ ).

Figure 1.5 Race and Ethnicity



Source: CDC National Center for Health Statistics.

Figure 1.6 Mean Age by Race and Hispanic Ethnicity

Race/Hispanic Ethnicity Group	Mean Age
White	40
Black	32
Asian	33
Hispanic	29
American Indian	35

Source: CDC National Center for Health Statistics.

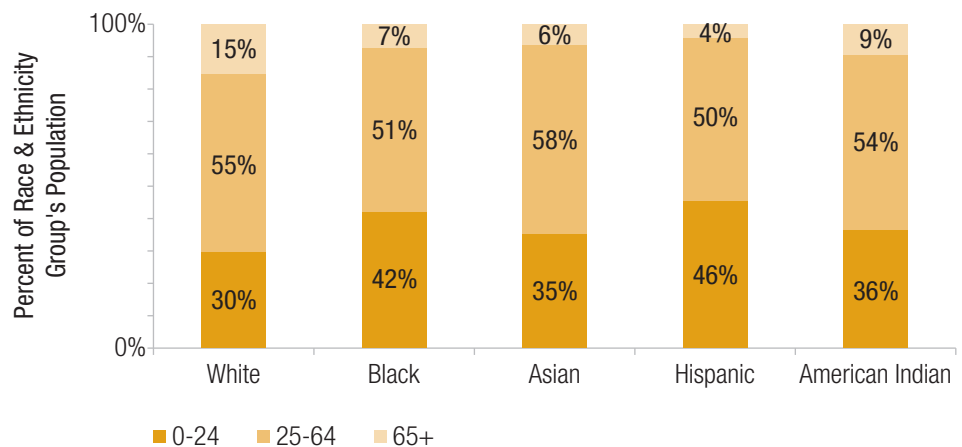
\*Race and Ethnicity mean ages are statistically different from the White mean age ( $p \leq 0.05$ ).

## Race and Ethnicity

The race and ethnic make up of Massachusetts has changed dramatically since the mid-twentieth century. In 1950, one out of 50 people was non-White; today, one in five people is non-White. Even so, the state has a smaller proportion of minorities than the United States does (MA, 21% vs. US, 34%). Its White population ranks 22<sup>nd</sup> among states.<sup>2</sup> The Massachusetts population is 8% Hispanic, 6% Black, 5% Asian, 0.2% American Indian, and 80% White (Figure 1.5).

The non-White race and ethnic groups have significantly younger populations than Whites do. The average age of Whites is 40, while the average

Figure 1.7 Race and Ethnicity by Age Groups



Source: CDC National Center for Health Statistics.

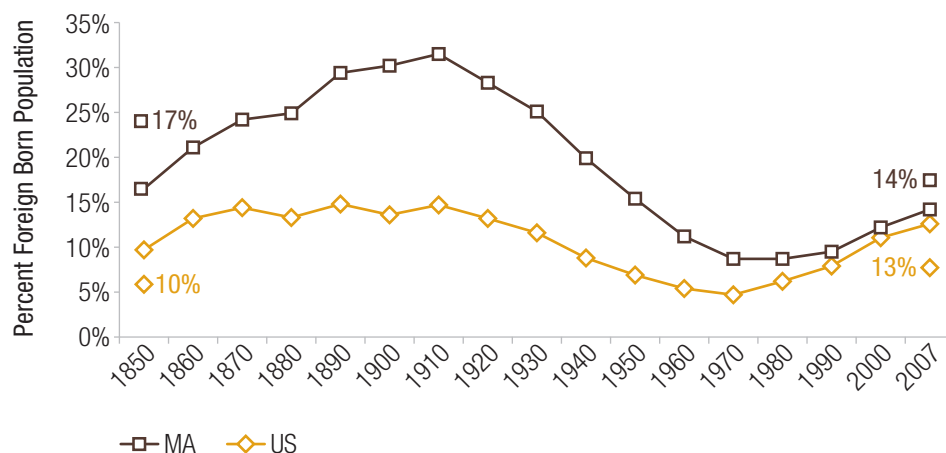
\*All Race and Ethnicity age groups are statistically different from White age groups ( $p \leq 0.05$ ).

age of Hispanics (the youngest age group) is 29 (Figure 1.6). All groups have more people younger than 25 than Whites do, while Whites have the largest percentage of persons ages 65 and older (Figure 1.7).

## Foreign Born

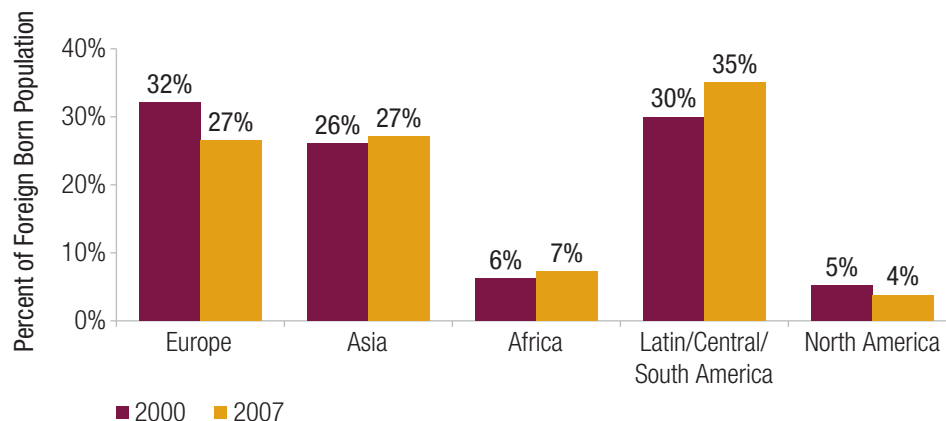
Massachusetts ranks 9<sup>th</sup> among the states in the percentage of its population that is foreign born at 14.2, while the United States percentage of foreign born is 12.6. There were large waves of immigrants from Europe in the late 1800s. Immigration declined until 1980 when it resurged (Figure 1.8). From 2000 to 2007, there were more immigrants from Africa and Latin America and fewer from North America and Europe (Figure 1.9).

Figure 1.8 Percent Foreign Born, Massachusetts and the United States, 1850-2007



Source: US Census Bureau.

Figure 1.9 Place of Birth of the Foreign Born



Source: US Census Bureau.

\*All percentages in 2007 are statistically different from the 2000 percentages ( $p \leq 0.05$ ).



### American Indian Tribes:

There are 11 recognized American Indian tribes in Massachusetts.<sup>3</sup>

Federally recognized tribes:

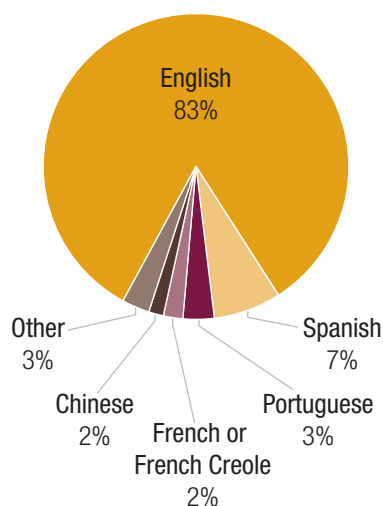
- » Wampanoag Tribe of Gay Head (Aquinnah)
- » Mashpee Wampanoag Tribe

State-recognized tribes:

- » Assonet Band of Wampanoags
- » Chappaquiddick Wampanoag
- » Chaubunagungamaug Nipmuck (Dudley)
- » Hassanamisco (thru Nipmuc Nation Tribal Council)
- » Herring Pond Wampanoag
- » Natick Nipmuc (thru Nipmuc Nation Tribal Council)
- » Pocasset Wampanoag (Fall River, Troy)
- » Ponkapoag
- » Seaconke Wampanoag (Rehoboth)

**In 1950, one out of 50 people was non-White; today, one in five people is non-White.**

Figure 1.10 Top Languages Spoken (Ages 5+)



Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

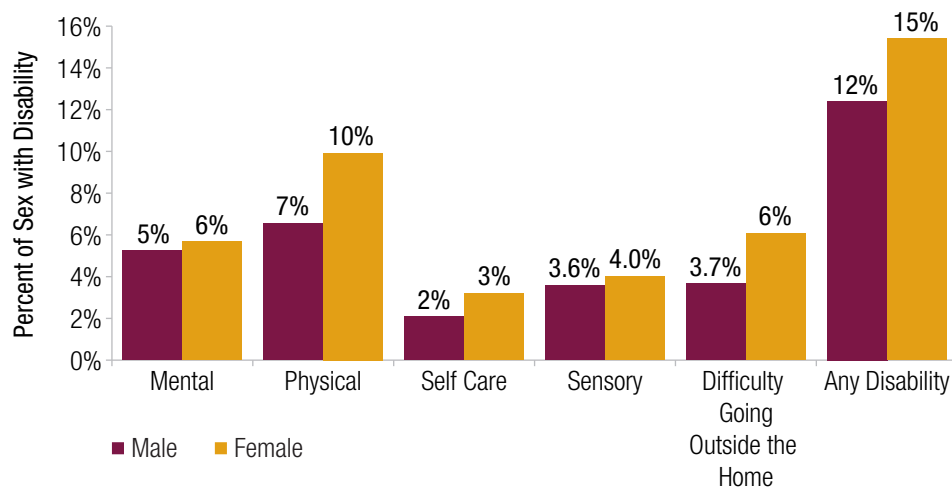
## Language

More than 20% of the population speaks a language other than English at home. This ranks 12<sup>th</sup> highest among the United States. Spanish, Portuguese, and French or French Creole are the top languages spoken. These languages account for 75% of the top non-English languages. Seven percent of Massachusetts residents speak Spanish compared with 12.3% of persons nationally. Almost 6% of the state's households are linguistically isolated, which means that no person age 14 years or over speaks English at least "very well." This means that there are an estimated 350,000<sup>4</sup> people who have difficulty communicating in their daily lives. Almost one-third of households that speak Asian languages are linguistically isolated as are 29% of Spanish-speaking households.

## Disability

Fourteen percent of the population ages five and older has one or more types of disability, which are sensory, physical, mental, self-care, and go-outside-home. Females have a significantly higher percentage of all types of disabilities than males do, with the greatest disparity in physical disabilities (Figure 1.11). The percentage of persons with disabilities increases with age (Figure 1.12). Over 37% of people sixty-five and older have one of more disabilities. Massachusetts ranks 43<sup>rd</sup> among the states for percent with any disability among those over sixty-five (the US percent is 41%). The state ranks 16<sup>th</sup> for those ages 5 to 20 who have any disability (MA: 7.2%; US: 6.4%).

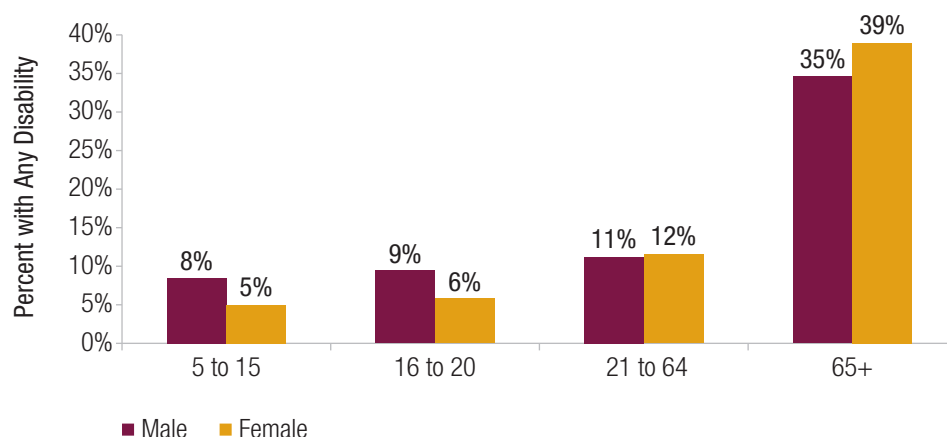
Figure 1.11 Disability by Type and Sex



Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

\*All female percentages are statistically different from male percentages ( $p \leq 0.05$ ).

Figure 1.12 Disability Status by Age Group and Sex



Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

## EOHHS Regions

The Executive Office of Health and Human Services (EOHHS) (of which MDPH is a part) divides Massachusetts into six regions for purposes of planning and resource delivery. The names of the regions are geographic: Western, Southeast, Northeast, Central, Metrowest, and Boston.

The regions are made up of cities and towns, and the health status of the regions varies. The number of people in each region varies from the largest, the Metrowest to the smallest, the Boston region (Figure 1.13).

Figure 1.13 Demographics of the EOHHS Regions

Region	Population	Number of Cities and Towns	Ages <20	Ages 65+	% Non-White	% Foreign Born (2000)	Largest City
Western Mass	833,216	102	25%	14%	19%	6%	Springfield
Central Mass	844,700	65	27%	12%	14%	7%	Worcester
Northeast	1,280,591	50	27%	13%	19%	12%	Lowell
Metro West	1,488,585	60	24%	9%	16%	12%	Cambridge
‡Southeast	1,278,245	69	27%	13%	11%	9%	Brockton
†Boston Region	711,603	5	23%	11%	46%	26%	Boston
State	6,436,940	351	26%	14%	19%	12%	Boston

Source: US Census Bureau and the MDPH Modified Age, Race/Ethnicity, & Sex Estimates, 2005.

†The Boston region includes Boston, Brookline, Chelsea, Revere and Winthrop.

‡The Cape & Islands part of the Southeast Region has 20% Ages <20 and 22% Ages 65+.

There are regional differences in race and ethnicity. Almost one-half of the Boston region's population is non-White, while only 11% of the Southeast region's population is non-White (Figure 1.13). The largest minority group

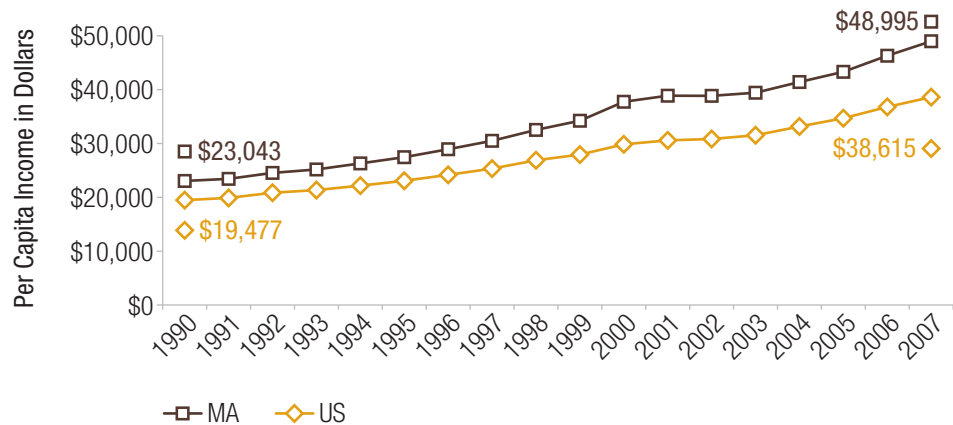
in the Western, Central, and Northeast regions is Hispanic. The largest minority group in the Southeast and Boston regions is Black, while the Asian population is the greatest in the Metrowest area.

## Income

The median family income is \$77,000, and the mean family income is \$98,000. The high rankings for income, the state ranks 4<sup>th</sup> in median family income and 7<sup>th</sup> in household income nationally, are counterbalanced in part by the high cost of living in the state. Massachusetts ranked 43<sup>rd</sup> worst in CNBC's cost of living rankings<sup>5</sup> and the cost of living index for Boston is 34% higher than the nationwide average.<sup>6</sup>

The state per capita income is \$49,000.<sup>7</sup> This ranks 3<sup>rd</sup> among states with only New Jersey and Connecticut having higher incomes. Since 1990, [at least] the state has had a higher per capita income higher than that of the United States (Figure 1.14).

Figure 1.14 Per Capita Income 1990-2008, Massachusetts and the United States



Source: US Department of Commerce Bureau of Economic Analysis, Regional Economic Information System, 1990-2008.

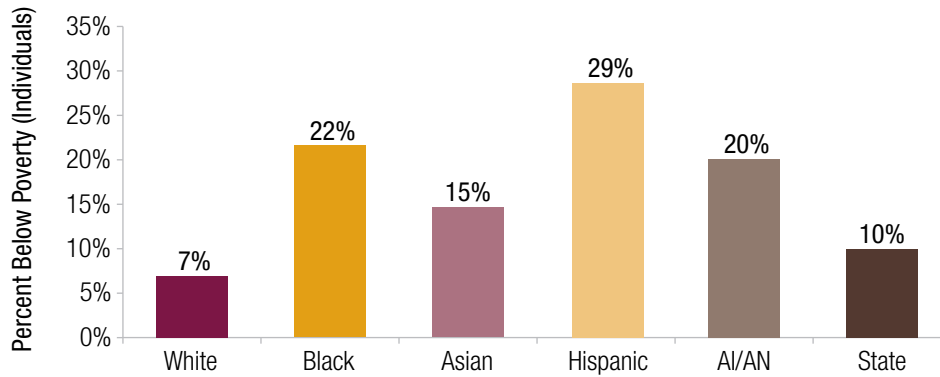
**Almost 39% of children under 5 years of age who are living in a female-headed household with no husband live in poverty.**

## Poverty

Despite the relatively high-income figures for the state, there is considerable poverty.<sup>8</sup> Ten percent of the state's population lives below poverty. Seven percent of the state's households (170,000) receive public assistance or food stamps. Certain groups are more likely to experience poverty. More than four times as many Hispanics live below the poverty level than White Non-Hispanics do (29% v. 7%). Almost 39% of children under 5 years of age who are living in a female-headed household with no husband live in poverty. One-fifth of people ages 16 to 64 with a disability live below poverty as compared with 7% of those without a disability.



Figure 1.15 **Percent Below 100% Poverty**



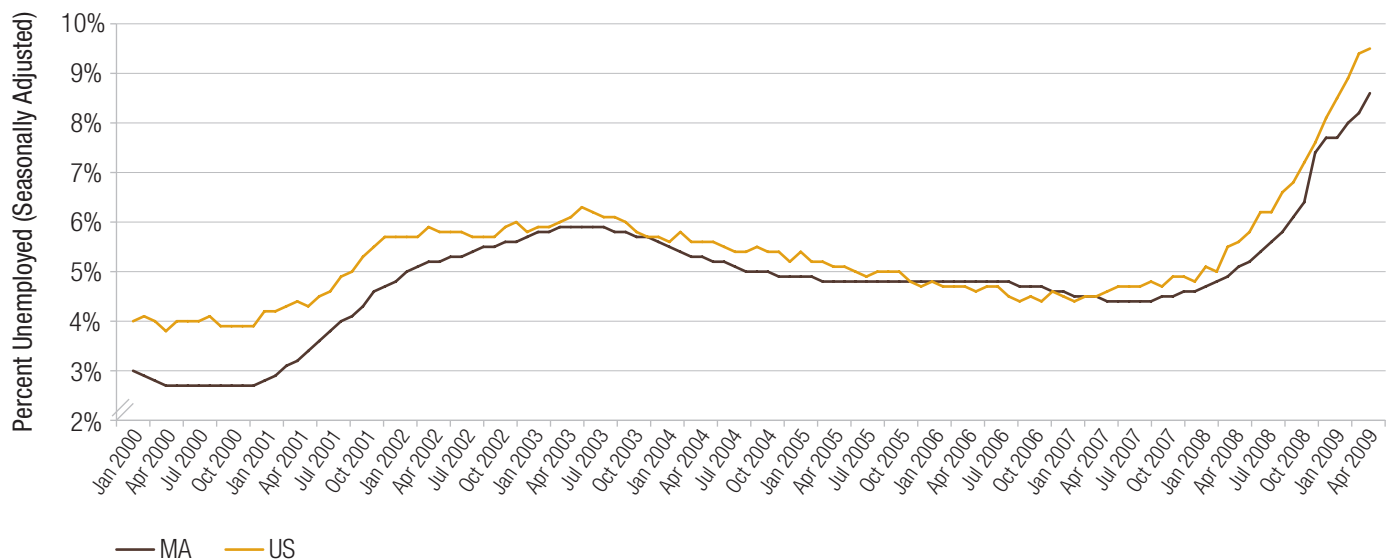
Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

## Unemployment

Since June 2007, the Massachusetts monthly unemployment rates have been below the national unemployment rates. Before then, unemployment rates rose above the national rates during the recession in the early 1990s.

Even though the state rate is lower than the national rate, it has risen over 28% per year since January 2008 (4.9% to 8.8%, July 2009). Only one-fourth of persons ages 16 to 64 with a disability is employed.

Figure 1.16 **Unemployment Rates, Massachusetts and the United States, 2000-2009**



Source: Massachusetts Division of Unemployment Assistance.

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## Industry and Occupation

In 1990, the manufacturing and trade, transportation, and utilities sectors of industry employed about 45% of the state's workers. Since then, employment in those sectors has dropped, and that share of the workforce is now employed in professional and business, and health and social services.

Today, about 40% of the civilian workforce ages 16 and over are employed in the managerial and professional occupations. The median earnings range for this group ranges from a low of \$41,000 for community and social workers to a high of \$81,500 for lawyers (Figure 1.17).

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Figure 1.17 **Occupations and Income**

Occupation Group	Median Income	Number of Employees	Percent of Employees
Management and professional	\$64,898	1,343,285	41%
Construction, extraction, maintenance, and repair	\$46,320	256,039	8%
Sales and office	\$41,397	803,847	25%
Production, transportation, and material moving	\$36,742	309,114	10%
Service	\$30,876	522,271	16%
Farming, fishing, and forestry	\$28,973	6,779	2%
State Median Income from Earnings	\$48,828	3,241,335	100%

Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

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## Education

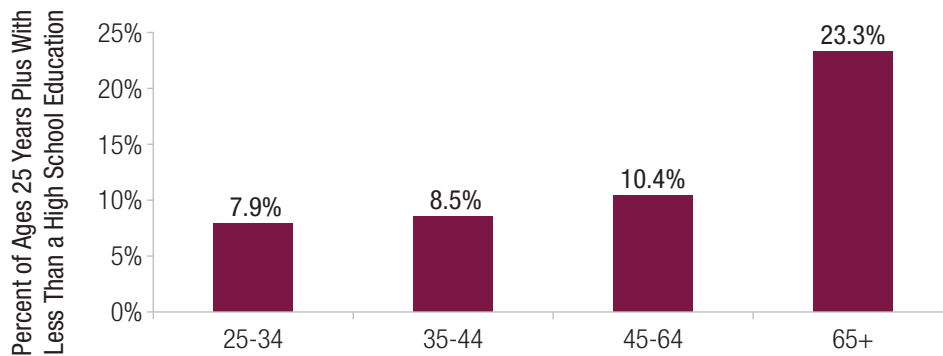
Massachusetts ranks first in the nation in the percent of persons over 25 who have a bachelor's degree or more (37%, including 16% with an advanced degree). Add to this the percentages with an associate's degree (8%) and those with some college but no degree (15%), and 60% of Massachusetts residents have been to college. Twenty-eight percent have graduated from high school.

These achievements are offset by the fact that 12% of the population has not graduated from high school. The percentage of Whites who do not have a high school diploma or equivalent is 10%, while the percentage of Hispanics is 35%. Among the foreign born, 25% do not have a high school diploma.

Educational attainment varies by age group. One fifth of those ages 65 and older has never been to high school (Figure 1.18).

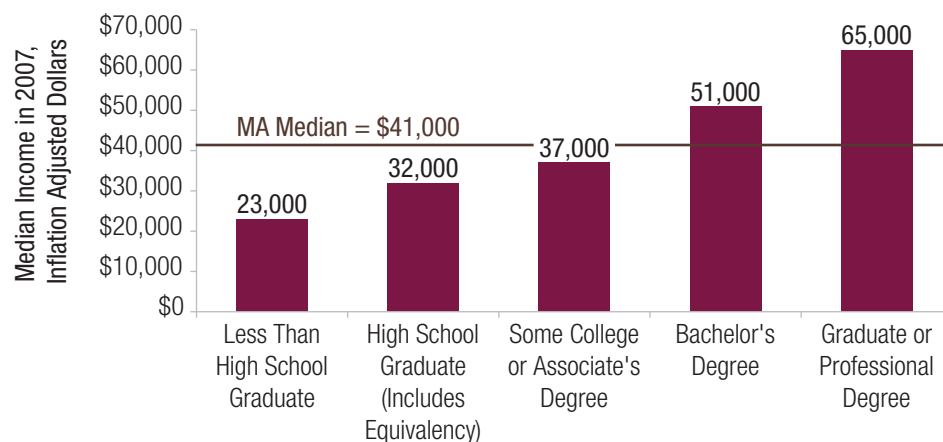
Education is closely related to income. Those with an advanced degree have a median income that is almost three times that of those with less than a high school education (Figure 1.19).

Figure 1.18 **Low Education by Age**



Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

Figure 1.19 **Median Income and Education**



Source: US Census Bureau, American Community Survey 3-Year Estimates, 2005-2007.

## Conclusion

The social and economic status of Massachusetts contributes to the health of the state. Its high education and income support healthy habits and good health outcomes among its citizens. At the same time, not all residents experience the benefits of the state's relative prosperity. The factors that often separate the prosperous and the poor are race and ethnicity, disability, age, gender, and immigration status. Efforts to evaluate and improve the state of health in Massachusetts must proceed from knowledge of the people and the conditions of their lives.



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**T**he Commonwealth's population is growing slowly and its composition is changing in two notable ways: Massachusetts is becoming more racially and ethnically diverse and its median age is rising. Each of these changes presents challenges for policy makers.

As cities across the Commonwealth become majority-minority, disparities in educational achievement and labor market outcomes, as well as health disparities need to be addressed. While there are important distinctions within each race-ethnic category (among Latinos, Cubans fare better than Dominicans; among Asians, Koreans fare better than Cambodians; among Blacks, West Indians fare better than native-born African Americans), poorer outcomes for minorities require a retooling of antidiscrimination policy to reduce disparities in labor and housing markets as well as education programs aimed at reducing dropout rates and improving education achievement.

The Commonwealth's changing age distribution is worrisome in two ways: Failure to attract or to retain younger workers, especially those with higher education, threatens the vibrancy of an economy heavily reliant on "knowledge workers." As the Baby Boomers begin to retire, it is crucial that a stream of educated workers be available to replace them. However, the high cost of housing has made Massachusetts, and especially the Boston metropolitan area, increasingly unaffordable, driving talent to other high-tech metropolitan areas where housing costs are lower. The creation of more affordable housing depends on reform of local zoning laws and the continued implementation of state housing programs.

If current Baby Boomers follow the path of previous generations of retirees, many will prefer to "age in place," in their current homes or elsewhere within their current communities. This will present challenges in many suburbs as local governments attempt to accommodate the

housing and transportation needs of a population that will, of necessity, rely on other means than private automobiles. This too implies a rethinking of current zoning restrictions and a focus on increasing density to increase choice and mobility for this population.

Policies created when Massachusetts was a faster-growing and less diverse place are obsolete. State and local governments will need to change their approach in a number of policy arenas, including education, antidiscrimination, housing, zoning, and transportation.



# FIGURE NOTES

**Figure 1.1:** US Census Bureau. Population Division. Gibson C. and Jung, K. *Working Paper Series No. 56: Historical Census statistics on population totals by race, 1790 to 1990, and by Hispanic origin, 1970 to 1990, for the United States, regions, divisions, and states*. <http://www.census.gov/population/www/documentation/twps0056/twps0056.html>. Published September 2002. Accessed September 16, 2009. The population for 2010 was projected by the Population Division in the State Interim Population Projections by Age and Sex: 2004 - 2030. Published 2005. Accessed January 4, 2010. <http://www.census.gov/population/www/projections/projectionsagesex.html>.

**Figures 1.2, 1.4, 1.5, 1.6, 1.7:** CDC National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000-July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the US Census Bureau; released August 7, 2008. <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm>. Accessed September 5, 2008.

**Figure 1.3:** The total for 2006 includes 1 marriage with missing gender information.

**Figure 1.8:** US Census Bureau. Population Division. Gibson, CJ and Lennon, E. *Population Division Working Paper No. 29, "Historical Census Statistics on the Foreign-born Population of the United States: 1850-1990"*, Table 8. Race and Hispanic Origin of the Population by Nativity: 1850 to 1990. February 1999. <http://www.census.gov/population/www/documentation/twps0029/twps0029.html>. Accessed September 16, 2009.

**Figure 1.9:** Data for 2000 are from US Census Bureau, Census 2000. Data for 2007 are from the American Community Survey, Data Set: 2005-2007. Those born at sea or born in Oceania = < 1%, and they were excluded from this figure.

**Figures 1.10, 1.11, 1.12, 1.15, 1.17, 1.18, 1.19:** US Census Bureau, American Community Survey, Data Set: 2005-2007 American Community Survey 3-Year Estimates. [http://factfinder.census.gov/servlet/DatasetMainPageServlet?\\_program=ACS&\\_submenuId=&\\_lang=en&\\_ts=](http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=). Accessed September 16, 2009.

**Figure 1.13:** The population for the EOHHS Regions in 2000 was calculated by adding the Census 2000 counts of the constituent cities and towns. The 2007 data are estimates from the US Census Population Estimates program, which were also aggregated from cities to regions. Table, SUB-EST2007-05-25. Population Division, US Census Bureau. Release Date: July 10, 2008.



**Figure 1.15:** Income Guidelines as published in the Federal Register on January 24, 2007. In this figure, race and Hispanic ethnicity are not mutually exclusive, except for White Non-Hispanic. For example, the “Hispanic” bar includes Hispanics of any race.

## ENDNOTES

- 1 US Census Bureau, American Community Survey Ranking Tables, 2007. Available at [http://factfinder.census.gov/servlet/GRTSelectServlet?ds\\_name=ACS\\_2007\\_1YR\\_G00\\_&\\_lang=en&\\_ts=271167695392](http://factfinder.census.gov/servlet/GRTSelectServlet?ds_name=ACS_2007_1YR_G00_&_lang=en&_ts=271167695392). Accessed August 13, 2009. Unless otherwise noted, the rankings in this chapter are from this source.
- 2 The ranking table (R0209) is for non-Hispanic white (alone) population, which we use as an estimate of the white population.
- 3 Massachusetts Commission on Indian Affairs (MCIA), Native American Tuition Waiver Program Guidelines, [http://www.mass.gov/?pageID=ehedmodulechunk&L=4&LO=Home&L1=Economic+Analysis&L2=Executive+Office+of+Housing+and+Economic+Development&L3=Department+of+Housing+and+Community+Development&sid=Ehed&b=terminalcontent&f=dhcd\\_ia\\_ia&csid=Ehed](http://www.mass.gov/?pageID=ehedmodulechunk&L=4&LO=Home&L1=Economic+Analysis&L2=Executive+Office+of+Housing+and+Economic+Development&L3=Department+of+Housing+and+Community+Development&sid=Ehed&b=terminalcontent&f=dhcd_ia_ia&csid=Ehed), accessed October 2, 2009.
- 4 Calculated as 5.6% of 2,448,648 households with an average of 2.54 persons per household.
- 5 <http://www.cnbc.com/id/19558099>.
- 6 US Census Bureau, Statistical Abstract of the United States: 2009 (128th Edition), Washington, DC, 2008. Table 706. Cost of Living Index—Selected Urban Areas: Annual Average 2007.
- 7 The United States Department of Commerce, Bureau of Economic Analysis estimate of per capita income (\$48,995) is higher than that of the American Community Survey (\$32,000) because of differing methodologies.
- 8 The federal 100% poverty level for a family of 4 in 2007 was \$20,650. Income Guidelines as Published in the Federal Register on January 24, 2007. For years 2005 and 2006, the poverty level was \$20,000. Health and Human Services websites: <http://aspe.hhs.gov/poverty/05poverty.shtml> and <http://aspe.hhs.gov/POVERTY/06poverty.shtml>. Accessed 10/2/09.





# Community Assets



Community assets are resources that provide a healthier environment for Massachusetts residents and can have a great impact on the health and quality of community life.<sup>1</sup>

Community assets can range from physicians per capita to access to public recreation programs. Several studies suggest that individuals' health can be influenced by where they live, work, or send their children to school.<sup>2</sup> Communities vary by the health-related assets that are available to their residents. Communities also vary widely when it comes to the disproportionate burden of disease, including diabetes, heart disease, asthma and other illnesses.

Taking stock of the assets in local communities can help residents mobilize around key issues, enhance these resources, improve the health of their residents and reduce health inequities across the Commonwealth.<sup>3</sup>

This chapter provides a snapshot of measures related to community assets. The two main sections within this chapter are Health Care Infrastructure, with an emphasis on the distribution of services, and Community Infrastructure, with an emphasis on assets that encourage healthy eating and active living. The data are presented by the six geographical regions within the Executive Office of Health and Human Services (EOHHS). Measures include health care capacity, distribution ratio of health care providers, farmers' markets, comprehensive master planning, public recreation programs, and availability of healthy foods options.

**Community assets are resources that can have a great impact on the health and quality of community life and provide a healthier environment for Massachusetts residents.**



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## What Does Community Mean?

Community may be defined as a grouping of people with diverse characteristics who are linked by physical or social environments, share common perspectives, and engage in joint action in geographical locations or settings.<sup>4</sup>

Physical environments in a community may include parks, open spaces, libraries, health centers, and businesses. Social environments in a community may include civic, social, neighborhood, church and other groups, where people participate and interact.<sup>5</sup>

A healthy community is one that is constantly creating and improving its physical and social environments. This enables its residents to encourage and support one another in living healthy and active lifestyles.<sup>5</sup>

Identifying and increasing access to community assets can transform communities and aid in improving the overall health of their residents.<sup>6,7,8</sup>

**One approach for creating sustainable and healthy environments is to implement policies, systems and environmental changes at the local or regional level.**

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## Building a Supportive Environment

Community assets provide people with opportunities to lead healthy lives by allowing them to make healthy choices more easily.

One approach for creating sustainable and healthy environments is to implement policies, systems and environmental changes at the local or regional level.

- **Policies** are laws, regulations, rules, protocols, and procedures designed to guide or influence behavior.
- **Systems change** occurs when one or several elements in a system substantially change, altering both their relationship to one another and the overall structure of the system itself.
- **Environmental changes** are changes to the economic, social, or physical environments.

These changes provide opportunities, support, and cues to guide people in making healthier behavior choices.<sup>9</sup>

Examples of policies, systems, and environmental changes include laws and regulations that restrict smoking in public buildings, implementation of the Chronic Care Model in health care settings, worksites that provide time off during work hours for physical activity, school wellness policies that include healthy food options and opportunities for physical activity, incorporating walking paths and recreation areas into new community development designs, and making healthy low-fat food choices available in municipal and school cafeterias.<sup>10</sup>

The economic benefits to the community are also a driving force behind strengthening community assets. Evidence shows that people want to live

in places where they are able to be active and healthy. A 1999 study by the Urban Land Institute of four new pedestrian-friendly communities determined that homebuyers were willing to pay a \$20,000 premium for homes in these areas compared to similar houses in surrounding areas that lacked pedestrian-friendly amenities.<sup>11</sup> Another study found that utilization of safety precautions in developing roads and thruways reduced vehicular traffic on residential streets by several hundred cars per day and increased home values by an average of 18%.<sup>12</sup>

Healthier communities can have a positive effect on physical activity, nutrition, and various chronic conditions.<sup>13</sup> Community assets can not only directly add value and appeal to current and prospective residents, but they can also indirectly lower costs associated with the economic burden of disease.

The way we design our communities can have a direct impact on our overall wellbeing.<sup>14</sup> In order to better understand community assets, one must look at the design of the community itself, from ensuring access to health care resources to implementing land use policies.

Massachusetts was recently awarded a federal Healthy Communities Grant, which supports eliminating socioeconomic and racial/ethnic health disparities as an integral part of its chronic disease prevention and health promotion efforts. (For more information on chronic diseases, please refer to Chapter 7.)

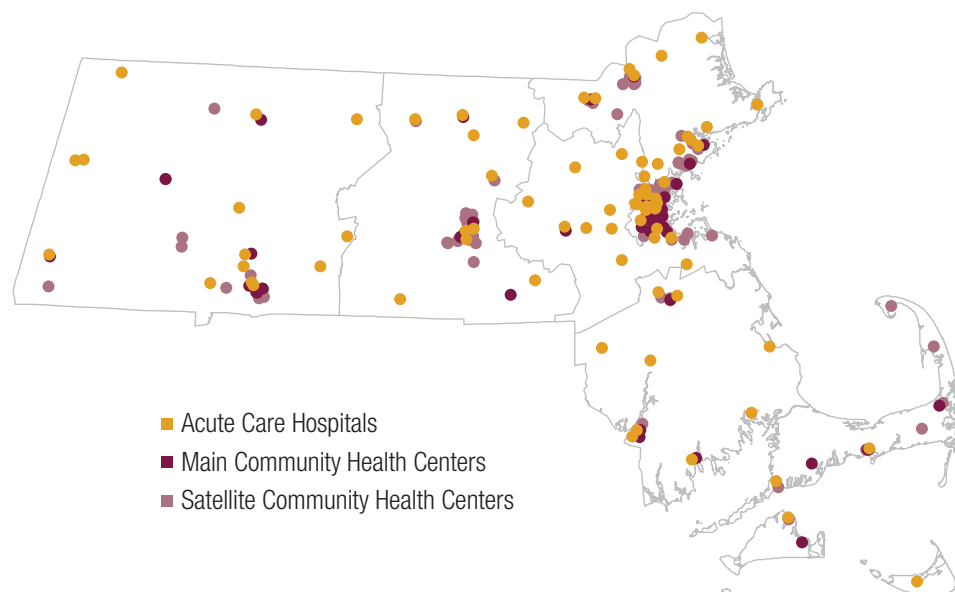
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### Health Care Infrastructure: Distribution of Resources

A vital community asset and a large component of the design of a community is access to high-quality health care services. Many individuals in Massachusetts do not have timely and equitable access to health care services. Among other factors, this may be due to the geographic location

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Figure 2.1 **Acute Care Hospitals and Community Health Centers**



Source: MDPH Office of Emergency Services, July 2009. Massachusetts League of Community Health Centers, MassGIS, April 2006.

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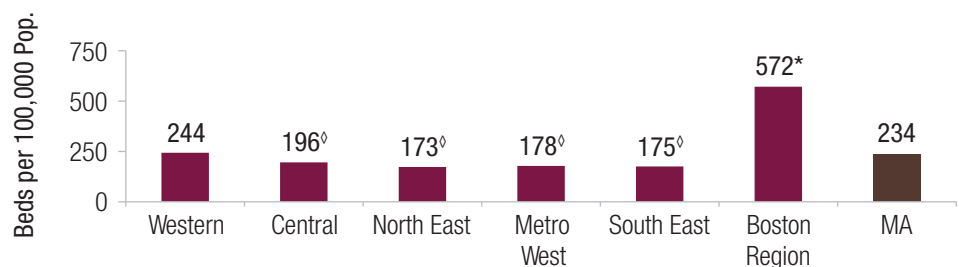
and distribution of health care facilities (Figure 2.1) and their capacity to serve their surrounding populations (Figure 2.2).

The availability of and physical access to hospitals and community health centers are integral community assets. However, delivering high quality health care services also depends on having enough primary care providers and other qualified health care professionals to serve the population.

Good primary care is associated not only with improved self-rated overall health and mental health of the population, but also with reductions in disparities between more and less disadvantaged communities in overall health.<sup>15</sup> Primary care helps to reduce the adverse impact of income inequality on population health, as measured by life expectancy, age-adjusted mortality, and leading causes of death.<sup>16</sup>

From a regional perspective, health care as a community asset is disproportionately represented in Massachusetts. While the Boston region has the highest number of acute care hospitals, community health centers,

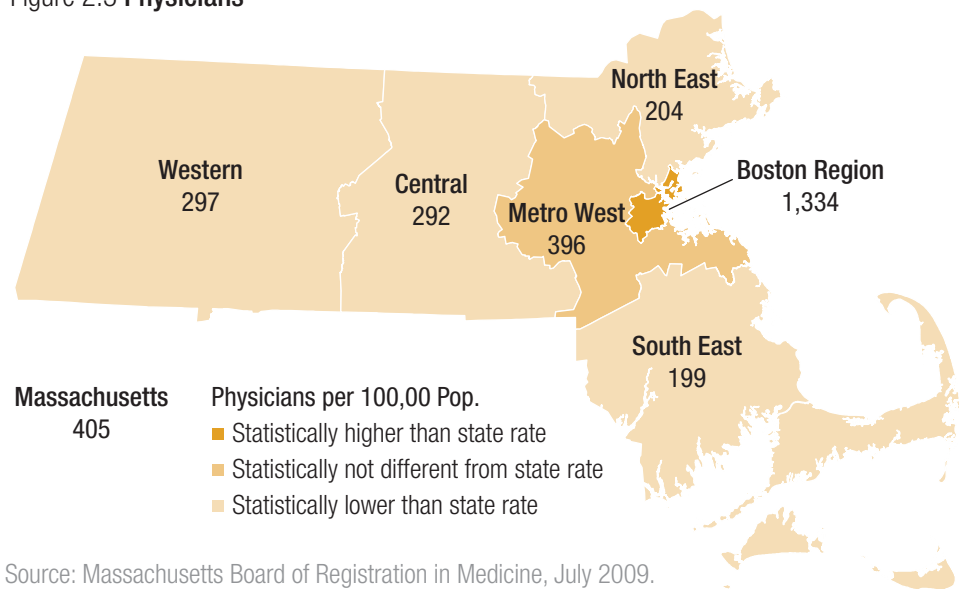
Figure 2.2 **Acute Care Hospital Beds**



Sources: MDPH Division of Health Care Quality, 2008; US Census 2007 population estimates for MA.

\*Statistically higher than state rate ( $p \leq 0.05$ ). °Statistically lower than state rate ( $p \leq 0.05$ ).

Figure 2.3 **Physicians**



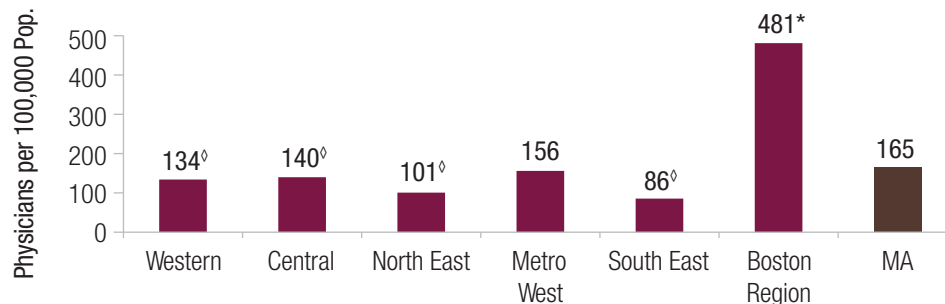
Source: Massachusetts Board of Registration in Medicine, July 2009.



and overall physicians (including primary and specialty care) per capita, it actually has a lower number of nurses per capita (including registered and licensed practical nurses) compared to the state as a whole.

The North and South East regions have the lowest number of acute hospital beds and number of physicians per capita. The South East region has no trauma center, and ranks lower than the state average for the number of community health centers and dentists per capita (Figures 2.3, 2.4 and 2.5).

Figure 2.4 Primary Care Physicians



Source: Massachusetts Board of Registration in Medicine, July 2009.

\*Statistically higher than state rate ( $p \leq 0.05$ ). <sup>◊</sup>Statistically lower than state rate ( $p \leq 0.05$ ).

Figure 2.5 Health Care Infrastructure by Region

	Western	Central	North East	Metro West	South East	Boston Region	MA
<b>Acute Care Hospitals and Community Health Centers (CHC) (Number per 100,000 population)</b>							
Acute Hospitals	1.7	1.2	1.2	1.0	1.0	2.0	1.3
with ER	1.5	1.1	1.1	1.0	1.0	1.4	1.1
Trauma Centers	0.2	0.1	0.4	0.1	<sup>◊</sup> 0.0	0.7	0.2
CHC	2.3	2.9	3.0	<sup>◊</sup> 1.7	<sup>◊</sup> 1.6	*7.3	2.8
<b>Medical Providers Licensed in Massachusetts (Number per 100,000 population)</b>							
Dentists	<sup>◊</sup> 60.1	<sup>◊</sup> 52.8	79.2	*124.9	<sup>◊</sup> 62.4	*120.1	85.5
Nurses	1,684.6	*1,888.9	1,739.8	*1,760.7	*1,991.8	<sup>◊</sup> 1,003.4	1,718.7
RN	<sup>◊</sup> 1,335.4	*1,536.3	1,416.6	*1,573.5	*1,598.6	<sup>◊</sup> 873.6	1,429.1
LNP	*349.2	*352.6	*323.2	<sup>◊</sup> 187.2	*393.2	<sup>◊</sup> 129.8	289.5
Physicians	<sup>◊</sup> 296.7	<sup>◊</sup> 292.4	<sup>◊</sup> 204.0	395.5	<sup>◊</sup> 199.3	*1,334.4	405.3
Primary Care	<sup>◊</sup> 134.0	<sup>◊</sup> 139.9	<sup>◊</sup> 100.7	156.0	<sup>◊</sup> 85.5	*481.1	165.2
General Practice	2.6	<sup>◊</sup> 0.8	1.7	2.4	2.6	3.4	2.2
Family Medicine	19.4	*31.3	24.0	<sup>◊</sup> 14.4	<sup>◊</sup> 17.3	22.9	20.7
Pediatrics	<sup>◊</sup> 27.3	<sup>◊</sup> 24.3	<sup>◊</sup> 20.0	33.9	<sup>◊</sup> 15.8	*109.3	34.5
Internal Medicine	<sup>◊</sup> 73.3	<sup>◊</sup> 73.2	<sup>◊</sup> 45.4	90.6	<sup>◊</sup> 42.0	*311.9	94.1
OB/GYN	11.5	<sup>◊</sup> 10.4	<sup>◊</sup> 9.5	14.7	<sup>◊</sup> 7.8	*33.6	13.6
Other Specialties	<sup>◊</sup> 162.7	<sup>◊</sup> 152.4	<sup>◊</sup> 103.4	239.4	<sup>◊</sup> 113.8	*853.3	240.1

Sources: MDPH Office of Emergency Services, July 2009; Massachusetts League of Community Health Centers, MassGIS, April 2006; MA Division of Health Professions Licensure, July 2009; Massachusetts Board of Registration in Medicine, July 2009.

\*Statistically higher than state rate ( $p \leq 0.05$ ). <sup>◊</sup>Statistically lower than state rate ( $p \leq 0.05$ ).

Implementation of Health Care Reform has identified and potentially exacerbated a clear imbalance of primary care access across the state, with long wait times and closed practices.<sup>17</sup>

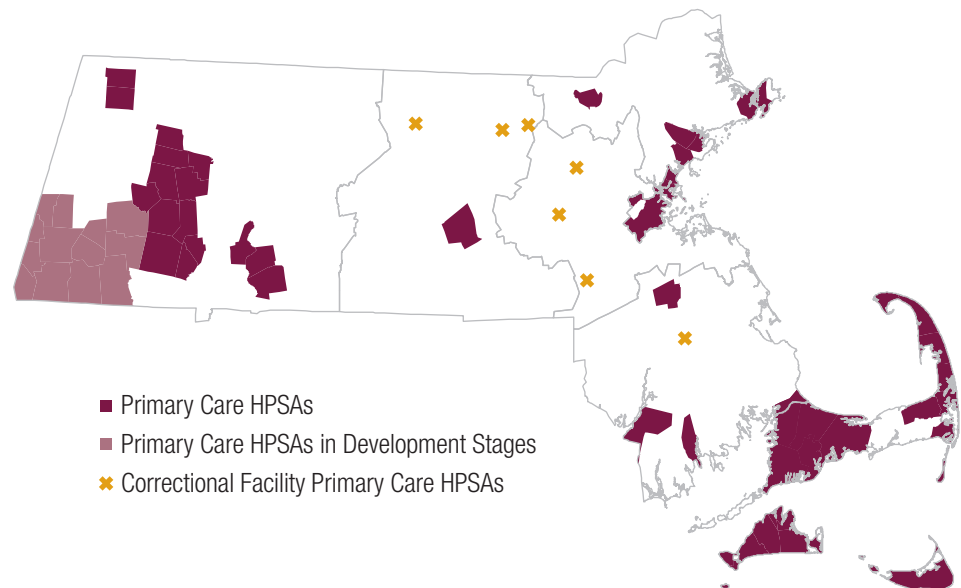
Regional disparities in health care access and infrastructure are further highlighted by the federal designation of Health Professional Shortage Areas (HPSAs).

To develop a HPSA application/designation, the MDPH Primary Care Office evaluates cities, towns, and census tracts in accordance with Health Resources and Services Administration (HRSA) guidelines to assess the availability of primary, dental and mental health care professionals.

HPSAs are utilized by Massachusetts communities and health care facilities to establish a need for additional health care professionals. This evaluation is based on criteria such as the number of primary care providers, poverty, infant mortality/low birth weight, fluoridation, youth and elderly population percentages, substance and alcohol abuse prevalence, and distance/travel time to nearest source of care. Each HPSA is given a score indicating the degree of health professional shortage. The higher the score, the greater the shortage. HPSA designations are updated every three to four years.

There is now a heightened significance to a HPSA designation, since a community or health care facility can potentially benefit from federal programs designed to support access to primary care in underserved areas.

Figure 2.6 **Primary Care Health Professional Shortage Areas (HPSA)**



A primary care designation considers the availability of physicians specializing in geriatrics, family medicine, general practice, general internal medicine, obstetrics-gynecology, and pediatrics.

Source: MDPH Division of Primary Care and Health Access, September 2009.

(See Figure 2.6 for current and emerging primary care shortage areas in Massachusetts.)

To help place health care professionals in areas where shortages exist, the Primary Care Office coordinates three programs: National Health Service Corps (NHSC), Massachusetts State Loan Repayment Program (MSLRP), and the J-1 Visa Waiver Program.

The J-1 Visa Waiver program helps place physicians with a variety of specialties in HPSAs. The MSLRP and National Health Service Corps supports a wide range of primary care providers in HPSAs. These programs are important recruitment and retention tools for communities and health facilities located in shortage areas.

Strengthening health care resources improves the health of local residents, and, since health care is one of the nation's largest industries and is often one of the largest employers, health care settings can also support the local economy by employing community residents. Health care facilities can also advocate for healthier communities<sup>18</sup> by supporting locally grown food, enhancing access to healthier food choices and physical activity, establishing farmers' markets, and supporting employee wellness.

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### Community Infrastructures: Supporting Healthy Eating and Active Living

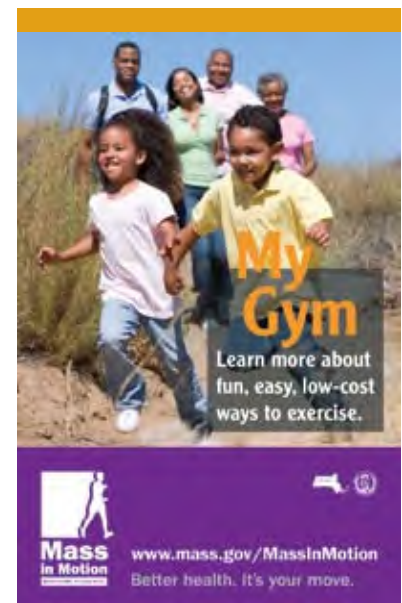
In addition to equitable healthcare,<sup>1</sup> community infrastructure offers accessible resources that contribute to a healthy environment that better enables individuals to lead healthy and active lives. Health enhancing community infrastructure is achieved through advocacy, policies, systems change and civic and environmental approaches.

The physical environment of a community greatly impacts the way we live, work and play, and thus also influences health. Comprehensive master plans are guidelines that communities can use to provide a clear vision of the community's developing physical environment.

A comprehensive master plan allows communities to address health and safety concerns, recommend zoning strategies, and develop land use policies that benefit the health of its residents. Such measures might include building sidewalks and crosswalks and reducing the speed of traffic to enhance walking and pedestrian safety.

In addition to master planning, communities can look to mixed-use design to encourage active living and healthy eating. Mixed-use refers to the deliberate mixing of housing, civic uses, and commercial uses, including retail establishments, restaurants, and offices.<sup>19</sup> Some of the benefits of mixed-use development can include revitalization of the community, more housing opportunities, promotion of pedestrian and bicycle traffic,

In 2008, Massachusetts instituted an additional loan forgiveness program for primary care physicians and nurse practitioners practicing primary care in an underserved area for at least two years.



"Mass in Motion," launched in January 2009, is a multifaceted wellness campaign. It recently awarded 10 Municipal Wellness and Leadership Grants, totaling more than \$1 million, to help communities across Massachusetts promote healthy eating and active living at the local level. (For more information on "Mass in Motion," see Chapter 7.)

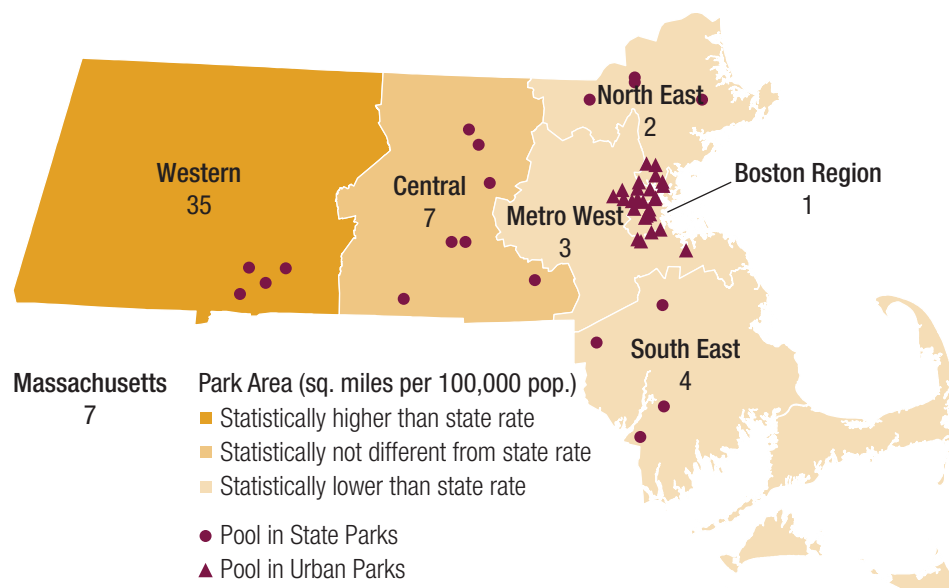
**Overall, 85% of communities who responded to the 2007 Survey of Policies and Programs Related to Health for Cities and Towns in Massachusetts provide some form of public recreation programs to their residents.**

increased opportunity for socialization, added sense of community, and encouragement of economic investment.<sup>19</sup>

Open space, including parks, playgrounds, courts, skating rinks and swimming pools provide places for people to engage in exercise and active play. Strong evidence has shown that supporting the creation and/or the enhancement of these places is an effective intervention for increasing overall activity levels.<sup>20</sup> Recreation programming can also serve as a vehicle for community cohesion.

Unfortunately, places for people to be physically active are not evenly distributed among all communities. In most cases, low-income individuals and people of color are less likely to live in communities with parks and public recreation programs.<sup>21</sup> Enhancing or creating equitable access to public recreation programs can help decrease these disparities.

Figure 2.7 Area of State and Urban Parks and Dept. of Conservation & Recreation Pools



Source: MassGIS, open-space and infrastructure layers, July 2009.

The western region of the state has a larger area of parks per capita. Yet, among those who responded to the 2007 Survey of Policies and Programs Related to Health for Cities and Towns in Massachusetts, a lower percentage of cities and towns in the western region said they have master plans, address walkability and sidewalks, permit mixed-used development, or have public recreation programs (Figure 2.8).

To further promote active living environments, communities can establish agreements that allow the use of public schools and other facilities for public recreational use during non-school hours and work together with schools to promote Safe Routes to School programs that ensure children can safely walk or ride their bicycles to school.<sup>22</sup> Understanding the safety

of the community is essential to the process of enhancing or creating access to places like parks and recreation facilities. Both perceived and real safety issues hinder people's ability to be active. People are more reluctant to jog, walk, or play if they perceive their neighborhood or their recreation area as unsafe, which in turn can lead to physical inactivity and sedentary behavior.

In addition to providing safe outdoor physical space for active living, communities can institute policies in schools and worksites where children and adults spend much of their time. Schools can promote healthy physical activities and incorporate them throughout the day, including before and after school. These activities can ensure that children get the 30-60 minutes of physical activity that they need daily. They also help to limit their use of television, video games and computers for non-educational purposes, which are activities that contribute to a sedentary lifestyle.<sup>23</sup>

Across Massachusetts, 95.7% of secondary schools required physical education in any of grades six through 12, and 83.3% offered intramural activities or physical activity clubs in 2008.<sup>24</sup>

Workplaces and employers can support active living by supporting physical activities (e.g., walking paths, safe bicycle storage, showers, and gyms) or subsidizing memberships to offsite fitness clubs either directly or through



#### Occupational Health:

Though employers are required to provide protection from on-the-job hazards for employees, wellness programs offer an opportunity to focus on preserving the health and wellbeing of workers as well. A comprehensive worksite wellness program not only protects employees from on-the-job injuries, but may increase employee attendance, productivity, overall health and company profitability. (See Chapter 9 for more information on Occupational Health.)

Figure 2.8 **Healthy Eating and Active Living Community Assets**

	Western	Central	North East	Metro West	South East	Boston Region	MA
<b>Municipal Infrastructure</b>							
<b>Communities:</b>							
With Master Plans	62%	79%	90%	94%	86%	25%	79%
Address Walkability	27%	42%	54%	76%	38%	25%	43%
Address Sidewalks	27%	45%	54%	76%	38%	25%	44%
Permit Mixed-Use Development	68%	78%	80%	88%	84%	100%	79%
Recreation Program	73%	76%	91%	100%	88%	100%	85%
<b>Communities That Have a Policy On:</b>							
Lighting on sidewalks	28%	33%	20%	39%	43%	100%	34%
Healthy Food Choices	71%	80%	83%	67%	No data	0%	72%
Menu Labeling	5%	4%	6%	4%	4%	0%	4%
<b>Worksite Infrastructure</b>							
<b>Worksites That Have:</b>							
Subsidized Exercise Facilities' Cost	49%	52%	53%	47%	39%	52%	48%
On-site Exercise Facilities	10%	5%	7%	15%	9%	10%	10%
Policies on Healthy Food Choices	19%	25%	25%	19%	19%	20%	21%
Access to Healthy Food Choices	35%	35%	42%	38%	44%	49%	41%
Nutrition Information Available	14%	8%	12%	9%	10%	9%	10%

Sources: MDPH Survey of Policies and Programs Related to Health for Cities and Towns in Massachusetts, 2007; MDPH Worksite Health Improvement Survey, 2008.





New state-wide menu labeling regulations requiring fast food restaurants to post caloric content, requiring state agencies to follow nutritional guidelines for procuring and preparing foods, and local bans on the use of cooking with *trans* fats are some of the ways Massachusetts is promoting healthy eating.

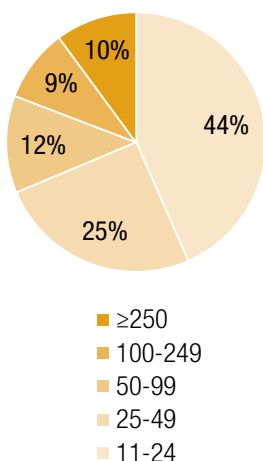
a health plan.<sup>23</sup> While only 10% of Massachusetts worksites reported having an on-site exercise facility for employees, almost half (48%) subsidize memberships to offsite physical activity facilities (Figure 2.8).

Community assets that support healthy eating begin with easy access to fresh and affordable food across all community venues. At the municipal level, having a healthy food choice policy for municipally-owned buildings is a common strategy implemented by Massachusetts cities and towns (Figure 2.8).

Appropriate strategies for worksites include providing access to healthier foods at on-site cafeterias, in vending machines, and at workplace meetings or events, and providing point of purchase nutritional information for all foods sold.

Twenty-one percent of Massachusetts businesses reported having written policies on healthy food choices. However, more than 40% of worksites reported actually offering employees access to fresh fruit and vegetables, 100% fruit juice, low-salt foods, fresh salads with low-fat dressings, 1% or skim milk, or fat-free or low-fat yogurt (Figure 2.8).

Figure 2.9 MA Businesses by Number of Employees



Source: MDPH Worksite Health Improvement Survey, 2008.

The percentage of businesses reporting access to healthy foods and policies to ensure healthy food choices was similar across regions. However, it varied by business size. Businesses with fewer than 25 employees had the highest percentage, reporting that they offer point of purchase nutrition information in cafeterias. This group represents 44% of all MA businesses (Figure 2.9). In addition, most businesses provide employees with access to a refrigerator, microwave, or both, allowing for employees to prepare healthy foods on site.

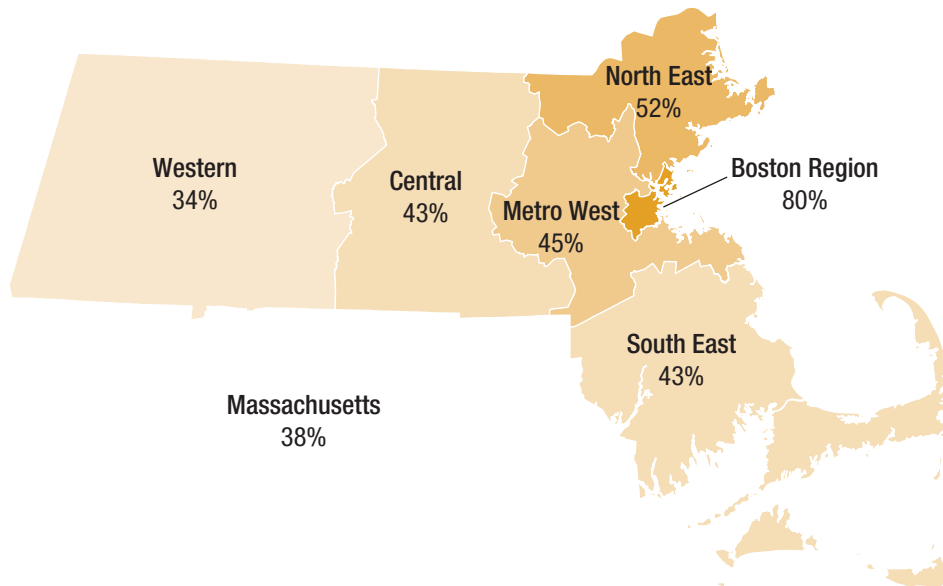
School systems are educating students about healthy eating behaviors, and creating policies to reduce access to junk food and unhealthy snacks.<sup>24</sup> Sixty-one percent of secondary schools in Massachusetts collect suggestions from students, families, and school staff on nutritious food preferences and approaches to encourage healthy eating. More than half (53.5%) of Massachusetts secondary schools provide information to students or families on the nutrition and caloric content of food available and 12.2% price nutritious food and beverages at a lower cost while increasing the price of less nutritious items.<sup>24</sup>

Unfortunately, disparities in access to affordable healthy foods exist.<sup>21</sup> Some communities address this by implementing policies that support healthy food choices in city- or town-owned facilities, establishing programs and incentives for grocery stores to locate in underserved areas, encouraging smaller stores to carry affordable nutritious options, and establishing local farmers' markets. Farmers' markets are a great resource for purchasing healthy, affordable, and locally-grown foods.

Though large areas of the western region are rural, surprisingly, this region of the state has a lower percentage of cities and towns that offer farmers'



Figure 2.10 Percent of Communities with Farmers' Markets



Source: Massachusetts Department of Agricultural Resources, August 2009.

markets compared to the state as a whole (34% of cities in the western region vs. 38% of cities in the state) (Figure 2.10).

## Conclusion

Community assets can play a significant role in the health and well-being of Massachusetts residents. Access varies from region to region.

Historically, health care prevention and community planning have been thought of as separate domains operating independently. In actuality, they are synergistic.<sup>18</sup> Both the infrastructure of the health care system and the assets of a community play important roles in ensuring health. Access to health care resources, access to healthy foods, and active living environments all contribute to the health of residents.

By implementing policies, systems, and environmental changes at the state and local level, we can strengthen the communities where people live, work and play; enhance opportunities for underserved communities; and strengthen the infrastructure of the health care system; all of which can lead to healthier communities and healthier individuals.



**Mary Bassett, MD, MPH**

Mailman School of Public Health, Columbia University  
Former Deputy Commissioner for Health Promotion and Disease Prevention, New York City Health Department

**R**esources necessary for a healthy life include families, communities, a range of services — including health services — and all levels of our government — federal, state and local. We have come to take some of these resources for granted — clean water flows from our taps, our food is free of microbes and other contaminants, buildings are ventilated and meet safety standards. These are universal assets. We expect them and become alarmed if deprived of them, holding our government accountable for such failures. But many assets are neither universal nor equally distributed among communities, such as the opportunity for physical exercise at home, work and school, or ready access to healthy foods like fruits and vegetables that are nutrient dense, as opposed to sugar-sweetened drinks that are energy-dense. Access to appropriate, timely and respectful medical care is key to health — and not yet universal. To be truly available, healthy choices must be affordable as well.

This chapter offers a welcome, practical approach to what may seem the difficult task of defining a healthy community and how to achieve it. A first step is cataloging assets and their distribution — and asking “why?” Why shouldn’t all farmers’ markets accept WIC coupons? What helps promote workplace support for bicycle storage, etc.? How can we address shortages of primary care doctors in our communities?

The question is how to make these changes. A century ago, government used prerogatives such as regulation, taxation, legislation and policy intervention to help achieve better housing, safe water and uncontaminated food. Perhaps, these will be useful tools again to help us solve the problems we face in the 21st century.



**Peter R. Lee, MPH**

Director, Mass Partnership for Healthy Communities,  
Health Resources in Action, Inc.

**W**e get or lose our health in the community we live, work or play in, but we, as a society, tend to spend all our time and resources talking about the medical/health care system as our source of health. We treat people in hospitals and clinics, then send them back into the community that often “caused” their problem in the first place. It is no wonder that the US continues to have one of the poorest health status rates of industrialized nations!

Access to medical care is important, but for people to be healthy, they need access to healthy environments, healthy neighborhoods, healthy homes, etc. We are a society that fixes things. We train professionals, especially in medical and human services, to identify (diagnose) what is wrong and fix it. Let’s make sure we widen our focus from treating individuals to treating the whole community that determines our health. Both medicine *and* the community must be health-promoting in order for us to be as healthy as possible.

This chapter highlights the concept of community assets – the things that help people be healthy. Healthy people come from healthy communities with plentiful assets (safe environments, healthy food, housing, jobs, opportunities for recreation, safety, etc.). Many unhealthy people come from communities that do not have access to these same assets.

If we want a healthier population, we need to focus more on those assets in a community that help make it easier for people to be healthy; help people to make the healthy choices and make those choices easier for them to practice. The authors lay out some important areas for moving forward for a truly population-based approach for healthy people in healthy communities.



# FIGURE NOTES

Throughout this chapter, the health care and physical resources per capita were based on 2007 US Census population estimates for Massachusetts cities and towns, aggregated by regions, and presented per 100,000 population.

Confidence intervals (CI) were calculated for all statistics presented. To determine whether a regional statistic was higher or lower than the overall state level, 95% confidence intervals were calculated and compared with that of the state, unless noted otherwise. If the regional lower 95% CI limit was higher than the upper 95% CI limit of the state rate, then the regional rate was *statistically higher* than the state rate. If the regional upper 95% CI limit was lower than the lower 95% CI limit of the state rate, then the regional rate was *statistically lower* than the state rate. If the confidence intervals overlapped, the regional estimates were reported as similar to the state level and no further comparison was made.

**Figure 2.1:** An acute care hospital is any hospital licensed under Section 51 of Chapter 111 and which contains a majority of medical-surgical, pediatric, obstetric, and maternity beds, as defined by the Massachusetts Department of Public Health.

**Figures 2.3, 2.4, 2.5:** Physicians includes all full and licensed physicians with a Massachusetts business address. It should be noted that a certain percentage of full and active licensed physicians with a Massachusetts business address do not practice clinical patient care or do not practice full time. Many Massachusetts physicians also teach and/or participate in research rather than provide clinical patient care. Primary care physicians include general practice, family medicine, pediatrics, internal medicine and OB/GYN.

**Figure 2.6:** Some HPSAs are designated by census tract only. Primary Care and Dental HPSAs are determined based on federal guidelines set forth by the Health Resources and Services Administration (HRSA). HPSAs in developmental stages are areas currently being evaluated by the Primary Care Office and/or HRSA for shortages. Applications are reviewed and submitted by the MDPH-Primary Care Office to the HRSA Bureau of Health Professions, Shortage Designation Branch. For specific guidelines: <http://bhpr.hrsa.gov/shortage/>; Primary Care Office contact: <http://www.mass.gov/dph/primarycare>.

**Figure 2.8:** Overall response rate for community survey varied by region, ranging from 48% to 80%.

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# H

## Health Care Access

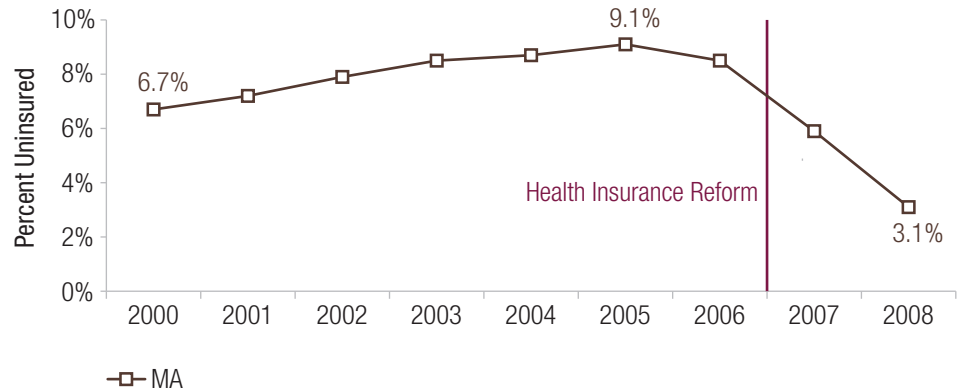


**H**ealth insurance status is a key factor affecting access to health care. Adults who do not have health insurance are more likely to have poor health and chronic diseases than those with health insurance. They are also less likely to obtain important health care services including preventive care, primary care, and tertiary care, and more likely to delay getting needed medical attention for illness or injury.<sup>1,2</sup>

On April 12, 2006, Massachusetts enacted legislation that would provide nearly universal health care coverage to state residents. All residents were required to purchase health insurance, through either private insurers or the newly created Commonwealth Care Program, by July 1, 2007 or face a financial penalty. By March 2009, 406,000 more Massachusetts residents had health insurance than before health care reform.<sup>3</sup>

**By March 2009, 406,000 more  
Massachusetts residents had  
health insurance than before  
health care reform.**

Figure 3.1 **Uninsured Adults 18-64**



Source: MDPH BRFSS 2000-2008.

\*The trend is statistically significant ( $p \leq 0.05$ ). This chart shows two-year moving averages.

Figure 3.2 **Components of the Landmark Health Care Reform Law**

Health care reform – often referred to as Chapter 58 – was signed into law on April 12, 2006, mandating in part:
• Adults required to purchase health insurance by July 1, 2007 or face a penalty.
• Employers with 11 or more employees required to offer health insurance.
• Commonwealth Connector created to “connect” individuals to insurance by offering affordable, quality insurance products.
• Commonwealth Care Program created as a low-cost insurance alternative for low-income families and individuals.
• Dental coverage for MassHealth adults and certain income-eligible members of Commonwealth Care.

Source: MA Health Connector, Health Care Access and Affordability Conference Committee Report.

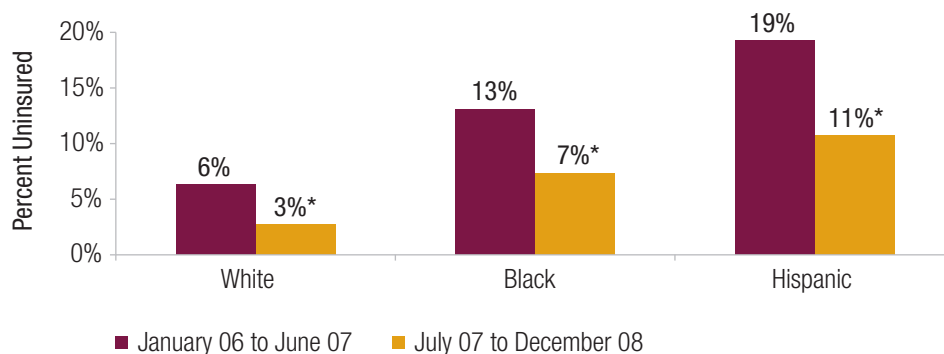
## Health Insurance Status

In the period since Health Care Reform, Massachusetts shows a large reduction in the rates of uninsured residents. The percentage of uninsured adults dropped significantly from 9% in 2005 – the year prior to Health Care Reform legislation – to 3% in 2008, which is an initial indicator of success for Health Care Reform (Figure 3.1).

Though the number of Blacks and Hispanics with health insurance increased after Health Care Reform, a substantial gap in health insurance coverage remained between these groups and White residents. In the eighteen months following Health Care Reform, only 3% of White adults aged 18-64 reported a lack of health insurance, as compared to 13% of Black adults and 19% of Hispanic adults (Figure 3.3).

Prior to Health Care Reform implementation, certain subgroups consistently reported lower rates of health care access and utilization. Young

Figure 3.3 **Uninsured Adults by Race and Ethnicity**



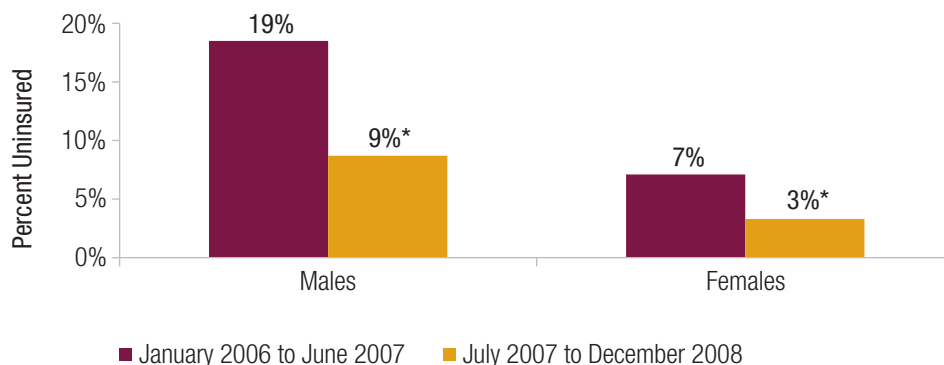
Source: MDPH BRFSS 2006-2008.

\*Statistically significant ( $p \leq 0.05$ ).

adults aged 18-34, males, and minority adults have been chronically underinsured and underserved in terms of health care (Figures 3.4 and 3.9)

Significant numbers of young adults aged 18-34 obtained health insurance after Health Care Reform. Among young males, the rates of uninsured fell from 19% to 9%. Among young females, the rates of uninsured fell from 7% to 3%.

Figure 3.4 **Uninsured Young Males and Females Ages 18-34**

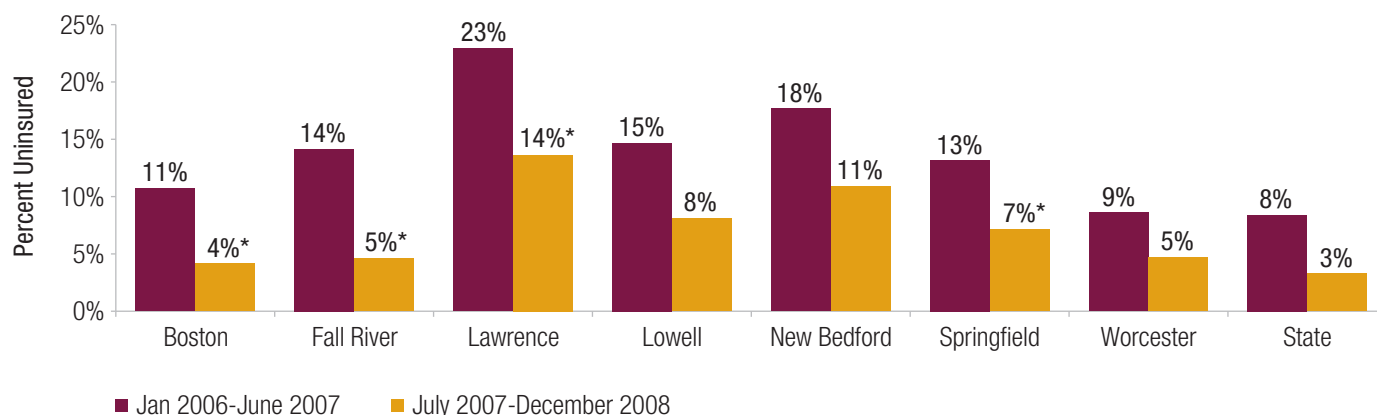


Source: MDPH BRFSS 2006-2008.

\*Statistically significant ( $p \leq 0.05$ ).

There are also geographic differences in the rates of those uninsured. Cities with larger numbers of minority adults – such as Lawrence, Lowell, and New Bedford – have a significantly higher percentage of uninsured adults compared with the state as a whole, and these disparities have persisted over time. Other large cities, such as Boston and Fall River had large reductions in the rates of uninsured residents (Figure 3.5). Boston's uninsured rate fell 82% and Fall River's fell 76%. Both cities uninsured rates are now approximately the same as that of the state. New Bedford and Lawrence experienced relatively smaller declines (55% and 40%, respectively).

Figure 3.5 **Uninsured Adults – Selected Cities**



Source: MDPH BRFSS 2006-2008.

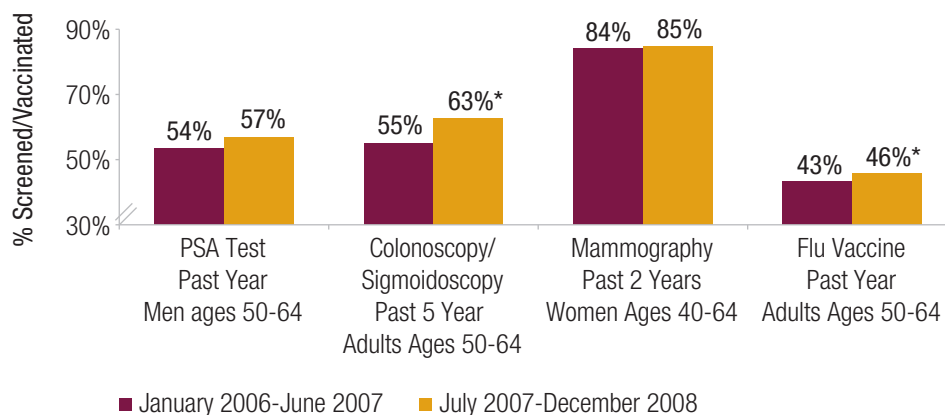
\*Statistically significant ( $p \leq 0.05$ ).

Though obtaining health insurance may make it more likely that residents will access health care, it does not guarantee access. It is important to look at other health indicators to evaluate access to health care. In addition to health insurance status, we tracked cancer screenings, flu immunizations, dental visits, and residents who reported having a Personal Health Care Provider (PHCP).

## Preventive Screenings

Massachusetts has one of the best cancer screening rates in the United States, with 85% of women age 40 and older reporting that they have had a mammogram in the past two years in 2008 (compared to the national average of 76%) and 64% of people age 50 and older reporting that they

Figure 3.6 **Screenings and Flu Vaccinations – Adults <65**



Source: MDPH BRFSS 2006-2008.

\*Statistically significant ( $p \leq 0.05$ ).



have had a colonoscopy in the past five years (compared to the national average of 52%). Rates of prostate cancer screening and flu vaccination are also high in Massachusetts.

In the months following Health Care Reform, both the rates of colonoscopy and flu vaccination improved for survey respondents age 50-64. Though these initial findings are encouraging, the long-term effects of health reform on use of preventive services have yet to be measured.

Figure 3.6 shows an increase in both PSA screenings and mammographies. These small increases in PSA and mammography screenings in this period were not statistically significant.

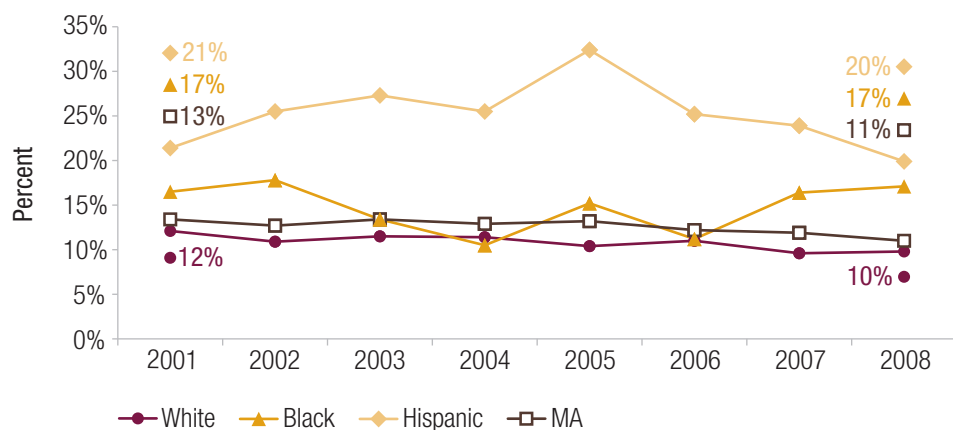
### Residents Who Have a Doctor or Other Personal Health Care Provider

Residents who have a personal health care provider (PHCP) are more likely to access preventive and routine care in the most appropriate clinical settings than those who do not have a PHCP.

However, even though only 3% of adults are uninsured, 11% report that they do not have a personal health care provider (Figure 3.7). Since Health Care Reform was enacted, fewer White residents report that they do not have PCHPs, but high percentages of Black and Hispanic residents still report not having PCHPs.

Are differences among cities in the percentage of adults who do not have a personal health care provider related to the availability of health care providers? When we look at the rates per 100,000 population of physicians who provide primary health services (family practice/general medicine,

Figure 3.7 **Adults Without a Personal Health Care Provider**



Source: MDPH BRFSS 2001-2008.

This chart shows two-year moving averages.

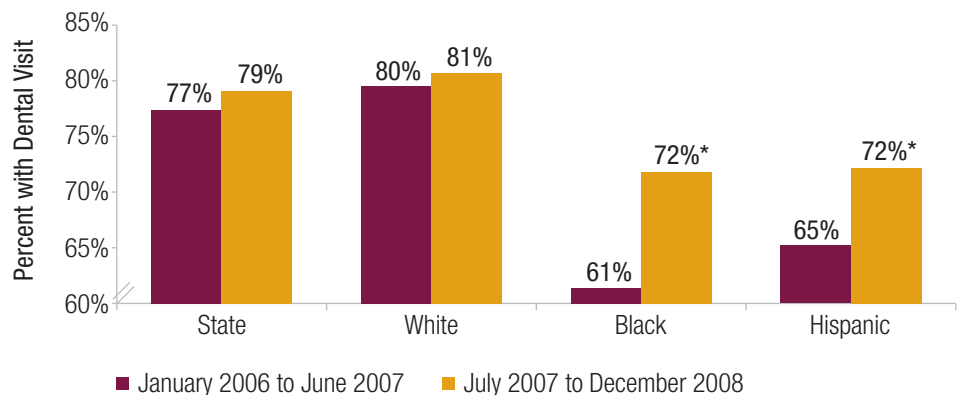
internal medicine, obstetrics, and gynecology, pediatrics/adolescent medicine) in the cities, no clear relationship between physician availability and having a PHCP emerges.<sup>4</sup> For example, Boston, which has the highest rate of physicians per 100,000 population, has a significantly higher percentage of those who do not have a PHCP than the state (18% v. 11%); while, Fall River, which has a relatively low rate of physicians, has a percentage similar to the state of those who do not have a PHCP.<sup>5</sup>

When determining how health care access can be improved in Massachusetts, identifying and addressing geographical differences such as these is critical.

## Visits to a Dentist

Oral health plays an important role in general health, and is an important indicator of health care access and utilization. The percentage of adults who visited a dentist in the past year has increased slightly over time, reaching 78% in 2008. Population subgroups, including young males (18–34), Blacks, and Hispanics have experienced significant improvements as well. However, gaps in dental care persist. Both Black and Hispanic residents have a lower rate of dental visits than White residents (Figure 3.8).

Figure 3.8 **Dental Visits in the Past Year**



Source: MDPH BRFSS 2006–2008.

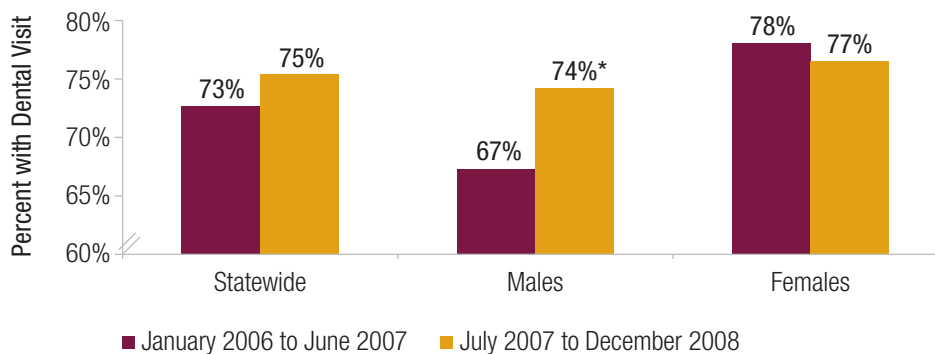
\*Statistically significant ( $p \leq 0.05$ ).

Rates of reporting a dental visit also vary across the state. Many large cities such as Boston, Springfield, and Worcester have similar rates of dental care (approximately 75%) as compared to the state rate of 78%. Other cities such as Fall River and New Bedford, however, report significantly lower rates of dental care (approximately 66%).

The period after implementation of Health Care Reform saw significant increases in the number of residents who visited a dentist. Since dental

care is an important part of general health, this represents another positive impact of Health Care Reform.

Figure 3.9 **Dental Visit in the Past Year – Adults Ages 18-34**



Source: MDPH BRFSS 2006-2008.

\*Statistically significant ( $p \leq 0.05$ ).

### Effects of Health Care Reform

The goal of Health Care Reform is to improve the health of Massachusetts residents by providing wider access to health care and preventative services, and to control medical care costs with early diagnosis and treatment of illness.

Massachusetts has seen a number of improvements in health care access and utilization. A comparison of the 18 months prior to Health Care Reform and the 18 months following reform shows a 53% decrease in the number of uninsured adults aged 18-64 across the state. Large numbers of young males (aged 18-34) and Hispanics obtained health insurance, as did residents of seven large Massachusetts cities with large minority populations.

Health Care Reform also provided dental care for MassHealth members, (the state's Medicaid program) and dental coverage for some Commonwealth Care members. Utilization of preventive care services for those below Medicare age also increased in the months following Health Care Reform. Increases in both flu vaccination and colorectal screening were significant.

However, statewide, and for some population groups, the impact of health reform was not clear. We have seen no significant change in the numbers of residents with PHCPs. There was initial concern that increasing health care coverage without expanding the pool of Personal Health Care Providers might lead to "crowd out," where despite increased access, an insufficient number of health care providers would be available. In addition, some healthy young adults may not feel they need to have a personal doctor.

There are fewer racial and ethnicity gaps in health care access and utilization, but important differences remain. Disparities still exist by age. Hispanics rank last among the three population groups presented here. Young males (aged 18-34) and residents in certain cities have had less improvement than other groups in health care access and utilization.

The effects of Massachusetts Health Care Reform will continue to evolve in the years to come. Initial indications show promise, but we must focus on the longer-term impact of this policy change. In particular, we need to ensure that Health Care Reform is far-reaching and inclusive of all ages, communities, and populations that have fared less well in the past and continue to lag behind.



**Robert Restuccia**

Executive Director, Community Catalyst



**Christine Barber**

Senior Policy Analyst, Community Catalyst

**M**assachusetts' landmark health reform law has resulted in significant improvements in access to health care for the people of the Commonwealth. There have been large gains in coverage, particularly for groups that have been traditionally more likely to be uninsured. Yet, the data show that important challenges remain. We still have much work to do in the areas of reducing racial and ethnic health disparities, enhancing the primary care workforce, and strengthening public health services. The state's budget crisis has threatened the progress that we have already made (the cutback in coverage of legal immigrants being the most glaring example) and will make it more difficult to address these issues. This means that we must work to maintain health reform's momentum.

Delivery system reform has moved to top of the state's political agenda, with an imperative to design a health system that provides quality, cost effective care. National health care reform may provide the state with additional tools to address these issues, but whether Congress will act is unclear at this time. In any case, the nation will surely be watching Massachusetts in its continued efforts to reform its health care system.

# FIGURE NOTES

The source for all figures in this chapter is the Massachusetts Behavioral Risk Factor Surveillance System.

**Figure 3.1:** All percentages are age-adjusted to US 2000 standard population.

**Figure 3.3:** Percentages are not adjusted for age of other socio-demographic population differences. Asians are excluded from this analysis due to the small numbers of respondents and the high variability of the data.

**Figure 3.5:** The MDPH BRFSS oversamples the cities of Boston, Fall River, Lawrence, Lowell, New Bedford, Springfield, and Worcester in order to calculate city-specific rates. Lawrence, Lowell, and New Bedford have significantly higher percentages of uninsured than the State does in 2008 ( $p \leq 0.05$ ). Percentages are not adjusted for age of other socio-demographic population differences.

**Figure 3.7:** All percentages are age-adjusted to US 2000 standard population.

**Figure 3.8:** Asians are excluded from this analysis due to the small numbers of respondents and the high variability of the data.



# ENDNOTES

- 1 Self-assessed health status and selected behavioral risk factors among persons with and without health-care coverage – United States, 1994-1995. *Morbidity and Mortality Weekly Report*. 1998; 47(09):176-180.
- 2 Weissman JS and Epstein AM. The insurance gap: does it make a difference? *Annu Rev Public Health*. 1993;14: 243-270.
- 3 Massachusetts Division of Health Care Finance and Policy “Key Indicators Report”. Available at: [http://www.mass.gov/Eeohhs2/docs/dhcfp/r/pubs/09/key\\_indicators\\_aug\\_09.pdf](http://www.mass.gov/Eeohhs2/docs/dhcfp/r/pubs/09/key_indicators_aug_09.pdf). Accessed on September 30, 2009.
- 4 Board of Medicine licensed physicians, Physicians Registered and Working in Massachusetts, Massachusetts Community Health Information Profile (MassCHIP), Massachusetts Department of Public Health, v 3.0, r323, October 19, 2009.
- 5 Massachusetts Department of Public Health, Bureau of Health Information, Statistics, Research and Evaluation, Health Survey Program. A Profile of Health Among Massachusetts Adults in Selected Cities, 2008. [http://www.mass.gov/Eeohhs2/docs/dph/behavioral\\_risk/cities\\_08.pdf](http://www.mass.gov/Eeohhs2/docs/dph/behavioral_risk/cities_08.pdf). Accessed on January 11, 2010.



# H

## Health Care Quality



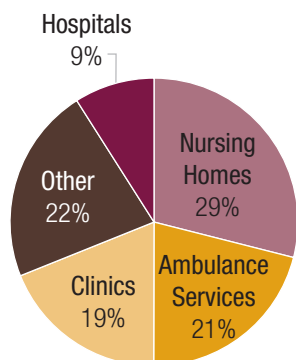
The Department is committed to ensuring quality and safety in health care across the continuum of care and throughout a person's lifespan. The MDPH Bureau of Health Care Safety and Quality is responsible for assuring that health care providers and health facilities provide safe, quality, and appropriate care to residents of the Commonwealth. From the licensing of health care professionals such as nurses and pharmacists, to the regulation and monitoring of pre-hospital ambulance services and licensure of hospital and long-term care facilities, the bureau works to assure that safe and appropriate care is provided to Massachusetts residents.

The Bureau licenses nearly 1,700 facilities, including 120 hospitals (acute and non-acute), nearly 450 nursing homes, and nearly 300 clinics. It also monitors more than 200 home health agencies and works to ensure that safe care is provided in all of these locations.

In addition to facility licensure, the bureau licenses more than 200,000 health care professionals throughout the state. More than 300 ambulance services with more than 1,700 vehicles are also licensed by the bureau. The Bureau also licenses over 1,500 pharmacies and wholesale druggists and issues Massachusetts Controlled Substances Registrations to over 44,500 health care professionals, facilities, and community programs.

The Division of Health Care Quality (DHCQ) conducts both licensure and certification activities for health care providers. When a provider applies to

Figure 4.1 **Facilities Licensed by MDPH**



Source: MDPH Bureau of Health Care Safety and Quality.

**The goal of SRE reporting is to gain a greater understanding of why such events happen and how they can be prevented in the future.**

be licensed or certified, DHCQ reviews the application to determine suitability as a provider, as well as compliance with state licensing regulations and federal regulations for participation in the Medicare and Medicaid programs. Periodic re-licensing and re-certification activities are also conducted.

DHCQ also handles reports of incidents and complaints and their related investigations. In any case where DHCQ determines that there is a significant lack of compliance with state and federal requirements, on-site follow-ups are conducted, as are enforcement activities, as warranted.

The following sections highlight activities that the Bureau performs to assure the safety and quality of the health care that the residents of Massachusetts receive.

## Monitoring Adverse Events and Infections in Hospitals

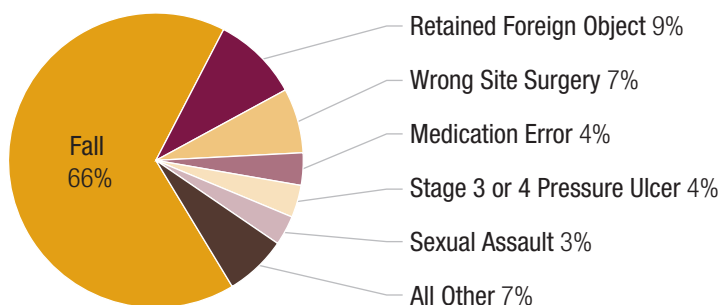
The Division of Health Care Quality monitors many aspects of hospital care, including events and infections that should not occur.

### Serious Reportable Events

Serious Reportable Events (SREs) (formerly known as “never events”) are a defined set of adverse medical events. These include medication errors, falls, stage three or four pressure ulcers and foreign objects retained in patients’ bodies after surgeries. The goal of SRE reporting is to gain a greater understanding of why such events happen and how they can be prevented in the future.

In April of 2009, the Department issued its first hospital-specific report of SREs<sup>1</sup> in the Commonwealth, along with the programmatic responses adopted by some hospitals to ensure prevention of such events in the future. There were 338 SREs in Commonwealth acute care hospitals in 2008. Sixty-six percent of these were falls.

Figure 4.2 **Hospital Serious Reportable Events, 2008**



Source: MDPH Bureau of Health Care Safety and Quality, 2008.

In 2009, regulations were adopted to implement a legislative mandate that prohibits a health care facility from charging or seeking reimbursement for services provided as a result of an SRE.<sup>2</sup> As part of these new regulations, specific requirements about communication with patients about the SRE were developed.

As additional data are collected, the impact of SRE reporting and related non-payment policies can be better analyzed. It will take several years of data collection to determine whether the public reporting and non-payment policies lead to a reduction in SREs. It is anticipated that, due to increased proficiency with SRE identification and reporting, the number of SREs reported may actually increase for a few years before there is a decrease in incidents.

## Healthcare Associated Infections (HAI)

A Healthcare Associated Infection (HAI) is an infection that is acquired in a health care setting and not found to be present or incubating at the time of admission. According to the Centers for Disease Control and Prevention (CDC), an estimated 1.7 million HAIs and 99,000 associated deaths occur annually in United States hospitals.<sup>3</sup>

Massachusetts acute care hospitals are now required to report specific data on HAIs to MDPH (Figure 4.3). Ten specific outcome and process measures were initially selected for reporting. The preliminary report of the first four months of data was released in April 2009.

Figure 4.3 Healthcare Associated Infections and Prevention Measures, 2009

	Reporting Level	
	Public	Internal
<b>Device-Associated Infections: Central Venous Catheter Associated Infections</b>		
Bloodstream Infection in Intensive Care Units	•	
Bloodstream Infection Outside of Intensive Care Units		•
Device-Associated Infections: Ventilator-associated pneumonia		•
<b>Procedure-Associated Infections: Surgical Site Infections</b>		
Hip Arthroplasty	•	
Hysterectomy	•	
Knee Arthroplasty	•	
Coronary Artery Bypass Graft	•	
<b>Multidrug-resistant Organism (MDRO) and Clostridium difficile-Associated Disease (CDAD)</b>		
Point prevalence of methicillin-resistant Staphylococcus aureus (MRSA)	•	
Clostridium difficile-associated disease (CDAD)		•
<b>Process Measure: Influenza vaccination of healthcare of workers</b>	•	

Source: MDPH, Hospital Circular Letter: DHCQ 09-09-516.

Note: "Public" – data submitted to MDPH; "Internal" – for reporting hospital's use only.



MDPH is working on statewide initiatives with hospitals and ambulatory surgical centers to prevent and reduce the incidence of HAIs in Massachusetts. These collaborative efforts include the dissemination of evidence-based preventive best practices, identification of specific process and outcome measures for monitoring, promoting transparency and accountability through public reporting, increasing community education and awareness, and professional education.

The Massachusetts HAI Prevention and Control Program is expanding prevention efforts to include free-standing dialysis centers and ambulatory surgical centers, long-term care facilities, and rehabilitation hospitals.

### Licensure and Inspections

**More than 13,000 reports, including more than 11,000 incident reports and approximately 2,000 complaints, were received for all facility types in FY2009.**

Investigating incidents and complaints is a key way in which the Bureau protects the health and safety of patients. More than 13,000 reports, including more than 11,000 incident reports from facilities and approximately 2,000 complaints, were received related to all facility types in FY2009.

In addition to the incident and complaint investigation, the Bureau conducted more than 1,400 certification and licensure inspections and follow-ups in the last fiscal year. Nursing homes have the greatest activity in this area (Figure 4.4).

Figure 4.4 Nursing Home Activities

	FY2005	FY2006	FY2007	FY2008	FY2009
Complaints					
Complaints received (from the public)	859	896	858	1,065	1,026
On-site complaint investigations	430	482	458	494	473
Incidents					
Incident reports Received (from the facility)	9,516	9,524	9,402	9,504	9,787
On-site incident investigations	529	537	521	479	482
Inspections					
Certification and recertification inspections and follow-ups	716	868	866	796	862
Licensure inspections and follow-ups	168	225	142	84	16
Total	12,218	12,532	12,247	12,422	12,646

Source: MDPH, DHCQ Incidents and Complaint System, FY2005-FY2009.

The Office of Patient Protection (OPP) functions as a consumer protection entity within the Bureau, to help consumers who are enrolled in a Massachusetts managed care plan and have questions or problems obtaining covered services. OPP primarily helps consumers in appealing managed care decisions. OPP had 373 external review requests in 2008, which is the



highest number of requests received since the office began in 2001. Behavioral health comprises the greatest number of requests.

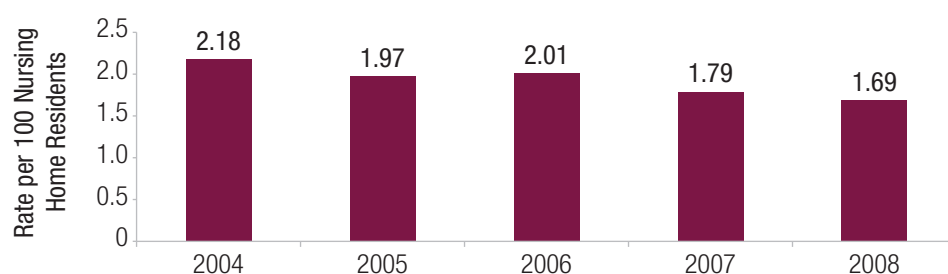
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## Falls

Falls are the most common cause of injuries, especially for older patients. They are thus a primary focus of many quality improvement initiatives. The Department has worked collaboratively with a wide variety of stakeholders to reduce falls. Of all falls injuries, hip fractures often have the most significant negative impact on a patient's quality of life. The rate of falls per 100 nursing homes residents has declined from 2.18 in 2003 to 1.69 in 2008.

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Figure 4.5 Nursing Home Falls with Hip Fractures



For more information on falls, see Chapter 11: Unintentional Injury.

Source: MDPH DHCQ Incidents and Complaints System, 2003-2008.

\*Rates significantly decreased for the period shown ( $p \leq 0.05$ ).

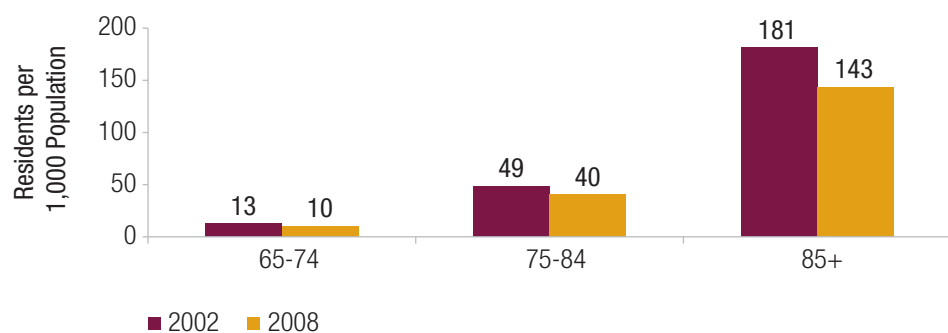
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## Utilization of Nursing Homes

The Bureau periodically assesses nursing home utilization rates in order to project future need for nursing home beds in the state. These assessments, along with national statistics, show that utilization of nursing homes by people ages 85+ has declined significantly. The trend may indicate

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Figure 4.6 Nursing Home Utilization Rates by Age Group



Source: US Centers for Medicare and Medicaid Services (CMS) Quality Improvement Evaluation System (QIES), 2002 and 2008.

movement away from nursing homes to new models of care or could also reflect a healthier older population.

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## **Special Projects in Hospital Care**

In addition to event monitoring and investigation, the DHCQ has undertaken several special projects in collaboration with Massachusetts hospitals designed to improve hospital treatment safety and quality.

### **Stroke**

The focus of the Bureau's stroke initiative is ensuring that eligible stroke patients receive IV-tPA, a clot-busting drug that has been effective in treating many strokes caused by artery blockage. However, results have shown that only a small percentage of stroke patients are receiving IV-tPA, primarily due to either patient delay in seeking treatment within the three hour treatment window or to medical system delays. Through a combination of public and provider education, public reporting, and regulatory inspections, the Department is working to promote greater use of IV-tPA in appropriate circumstances.

### **Cardiac Care**

The MassCOMM trial is a randomized trial comparing the safety and outcomes of non-emergency percutaneous coronary interventions (PCI or angioplasty) conducted at community hospitals that do not have cardiac surgery backup services, and also at tertiary facilities that do have cardiac surgery backup. As of February 2010, eight community hospitals and seven tertiary hospitals are participating in the trial.

Massachusetts enacted legislation in 2000 establishing that a Cardiac Care Quality Advisory Group develop standards for collecting cardiac data. The legislation also dictated the composition of the group. Regulations passed in April 2002 required all Massachusetts hospitals providing cardiac surgery and/or angioplasty to collect patient data. The Massachusetts Data Analysis Center (Mass-DAC) is the data-coordinating center that collects monitors and validates patient-specific outcome data for all hospitals in the Commonwealth. Data are reported annually and allows the monitoring of outcomes for cardiac surgery and angioplasty.<sup>4</sup>

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## **Emergency Medical Care**

### **Emergency Department Diversion**

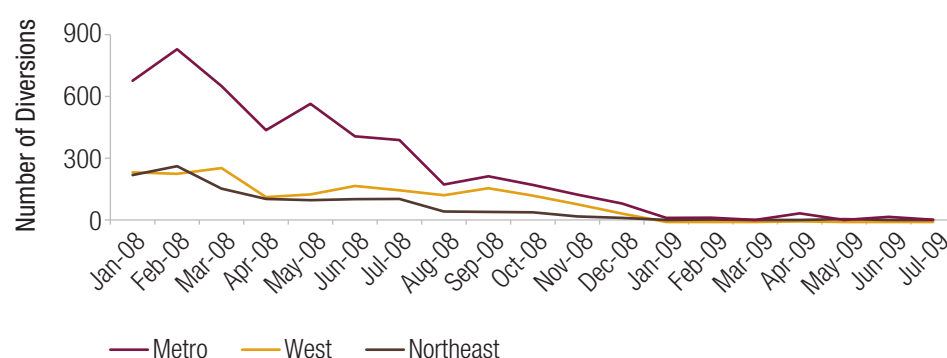
In January of 2009, Massachusetts became the first state in the country to ban the diversion of incoming ambulances to other hospitals, except in

the event of an internal emergency or “code black.” It had been shown that diversion had not helped with emergency department overcrowding, and in fact may have been contributing to it. Diversion from one hospital often creates overcrowding at nearby hospitals. Patients could also have been diverted away from hospitals where their doctors practiced or where they habitually sought care.

In the months since the policy has been enacted, data collected indicate that wait times at emergency departments have not increased, even without diversion as an option. Hospitals have worked to address patient flow issues in order to reduce overcrowding and boarding in the emergency department.

**In January of 2009, Massachusetts became the first state in the country to eliminate routine ambulance diversion.**

Figure 4.7 **Emergency Department Diversions**



Source: MDPH, Hospital Emergency Department Data Collection System, 2008-2009.

## Erwin Hirsch State Trauma Registry

The lack of trauma data has put the Commonwealth at a distinct disadvantage in providing evidence-based quality indicators on the effectiveness of the state’s trauma system and emergency planning. MDPH’s new Erwin Hirsch State Trauma Registry now enables the Bureau to use severity-adjusted data to evaluate the timeliness and quality of trauma care, monitor patient safety and conduct clinical benchmarking with the goal of refining the statewide treatment and trauma triage protocols. MDPH has formed a State Trauma Outcomes Committee (STOC), which has begun exploring factors contributing to the higher probability of death among injured patients in certain geographic regions of the state and will provide recommendations for reducing variation in quality of care and improving patient outcomes across the state.

## Massachusetts Ambulance Trip Record Information System (MATRIS)

MDPH has completed building the new Massachusetts Ambulance Trip Record Information System (MATRIS). In calendar year 2010, Massachusetts licensed ambulance services will begin submitting vital data to MATRIS that will allow the Bureau to evaluate and improve pre-hospital

**There were nearly 1.6 million  
ambulance trips in the  
Commonwealth last year.**

emergency medical care in the Commonwealth, including EMT training, ground and air ambulance resource distribution, emergency communications, patient outcomes, and the effectiveness of hospital emergency medical control networks. MATRIS prehospital data will ultimately be linked to the hospital data, police crash reports, and death records to provide a clear picture of the entire spectrum of care from the trauma scene to the hospital.

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## **Summary**

The activities discussed are examples of some of the vital work done by the Bureau and the Department to protect the health of patients and communities. Other critical activities include the work of the Bureau's Drug Control Program (DCP) to ensure that pharmaceuticals are available for medical use, while preventing drug diversion, prescription fraud, and illicit use and abuse of prescription drugs. The DCP's enhanced Prescription Monitoring Program, due to launch in 2010, will help the Commonwealth to track prescription fraud and inappropriate prescribing practices that can lead to substance abuse and addiction disorders.

The Bureau of Health Care Safety and Quality is committed to protecting, preserving and promoting the health of all residents in the Commonwealth through strategic health planning, and by assuring the delivery of safe, high quality, person-centered health care for all.



**Paula Griswold**

Executive Director, Massachusetts Coalition for the Prevention of Medical Errors

In Massachusetts and nationally, policymakers and the media have focused on two patient safety issues, serious patient safety events, called Serious Reportable Events, and Hospital-Acquired Infections, with calls for public accountability through public reporting, and improvements to prevent patient harm from these events. Locally, the Massachusetts Healthcare Quality and Cost Council went so far as to set the ambitious goals of eliminating hospital-acquired infections in Massachusetts by 2012, and serious patient safety events.

Nationally, Consumer Reports has repeatedly advocated public reporting of infection rates by hospital, encouraging subscribers to support state and national legislation. In fact, the March 2010 issue includes information listing hospital-specific infection data from fifteen states. (The report can be found at [www.ConsumerReport-sHealth.org/hospitalinfections](http://www.ConsumerReport-sHealth.org/hospitalinfections).) National health reform legislation has included requirements for public reporting, and the American Recovery and Reinvestment Act provided funding for states to offer programs to help hospitals learn and share best practices for infection prevention, to improve care while reducing healthcare costs.

Massachusetts has taken great strides in addressing these priorities and recommended strategies. Annual public reporting of hospital-specific data for Serious Reportable Events and infection rates creates public accountability, and allows for insightful analysis of the underlying causes, and effective actions to prevent future occurrences. The public debate provides the opportunity to highlight how healthcare organizations are working to improve their “culture of safety”, correct their unsafe processes, and share the lessons learned with others.

The Massachusetts Department of Public Health – and now the federal government – have funded programs to support and accelerate the efforts of individual hospitals for infection prevention. The Massachusetts Coalition for the Prevention of Medical Errors, in collaboration with the Massachusetts Hospital Association and hospitals in the state, has organized educational sessions for local and national hospital teams to share their tools and strategies with colleagues throughout the state. (A collection of infection prevention successes from the project is posted at [www.macoalition.org](http://www.macoalition.org).)

The impact on patient safety is already visible. These activities sustain healthcare leadership focus on these patient safety priorities, ensure public accountability, and accelerate progress through shared learning.

Safety in health care is of paramount importance to the success of health care reform and the lives of patients. Massachusetts has much to be proud of in its bold steps in public reporting and prevention efforts. Our hospitals and health care facilities are partners in this successful transition to greater transparency and continuing improvement.





# FIGURE NOTES

**Figure 4.5:** Nursing home population denominators from the US Centers for Medicare and Medicaid Services (CMS) Quality Improvement Evaluation System (QIES).

**Figure 4.6:** Population denominators from the Census Bureau Population Estimates for MA 2008.

# ENDNOTES

- 1 "Serious Reportable Events in Massachusetts Acute Care Hospitals: January 1, 2008 – December 31, 2008" [http://www.mass.gov/Eeohhs2/docs/dph/quality/healthcare/sre\\_acute\\_care\\_hospitals.pdf](http://www.mass.gov/Eeohhs2/docs/dph/quality/healthcare/sre_acute_care_hospitals.pdf).
- 2 105 CMR 130.332 (<http://www.mass.gov/Eeohhs2/docs/dph/regs/105cmr130.pdf>) and 105 CMR 140.308 (<http://www.mass.gov/Eeohhs2/docs/dph/regs/105cmr140.pdf>).
- 3 McKibben L., Horan T., et al. Guidance on public reporting of healthcare associated infections: Recommendations of the Healthcare Infection Control Practices Advisory Committee. AJIC. 2005: 33:217-226.
- 4 A preliminary report is available from Mass-DAC online at <http://www.massdac.org/sites/default/files/reports/CABG%20FY2007.pdf>. See page 35 for PCI and page 30 for CABG.



# N

## Nativity and Early Childhood



This chapter presents information about the changing demographics of the Massachusetts birth population, maternal and infant health characteristics, and service utilization.

Data on births, fetal deaths, and infant deaths are obtained from records collected by the Registry of Vital Records and Statistics. These data, along with data from statewide maternal and child health programs and surveillance systems, provide information on the health and well-being of mothers, infants and children in the Commonwealth. They are essential for surveillance, research, and informing public health programs, policies, and interventions.

The health outcomes for women, infants and children in Massachusetts compare quite favorably with those of the United States. Massachusetts has infant mortality and teen birth rates that are among the lowest in the country. However, there are certain health indicators that have not seen improvement, and substantial disparities persist in many health outcomes.

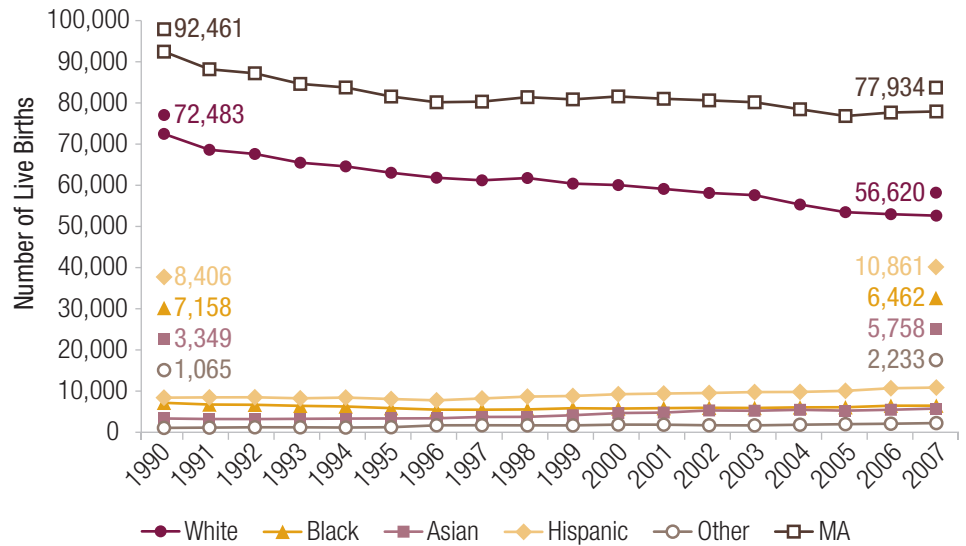
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### Births

Since 1990, the total number of births in Massachusetts has decreased by 16%, and the demographics of the birth population have changed substantially.

In 1990, 22% of births were to non-White mothers. In 2007 this percentage had grown to 32%. The proportion of births to foreign-born mothers

Figure 5.1 Trends in Births



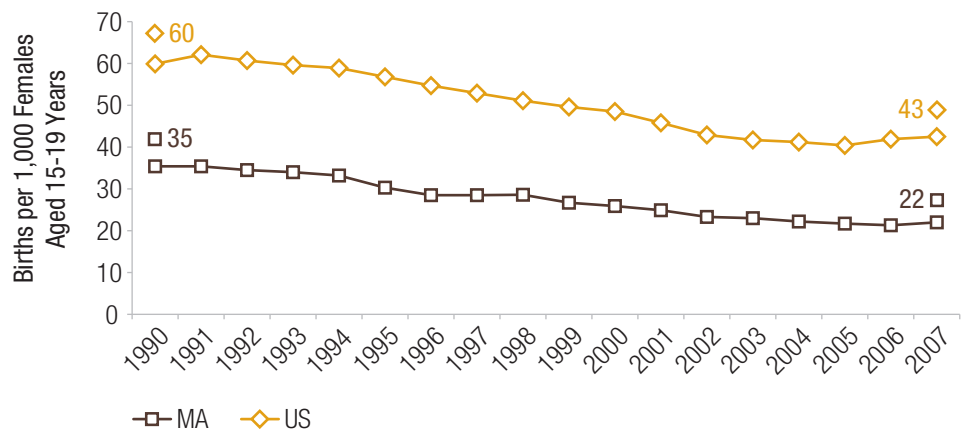
Source: MDPH Birth File, 1990-2007.

has also increased from 15% in 1990 to 27% in 2007. There has also been a marked change in the age of Massachusetts mothers in the past two decades. In 1990, 40% of mothers were over age 30. In 2007, 53% were over age 30.

## Teen Births

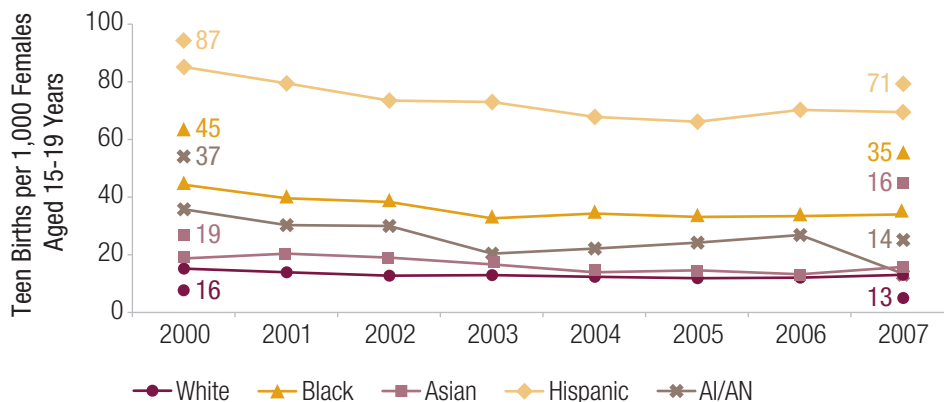
Teen birth is an important public health issue, associated with long-term negative outcomes for both mother and child.

Figure 5.2 Trends in Rates of Births to Teens Aged 15-19 Years



Source: MDPH Birth File, 1990-2007.

Figure 5.3 Trends in Teen Birth Rates



Source: MDPH Birth File, 2000-2007.

The birth rate among Massachusetts women aged 15-19 years has decreased by 38% since 1990 and has been consistently lower than the national teen birth rate. In 2007, the Massachusetts teen birth rate (22 births per 1,000 women ages 15-19 years) was almost half the U.S. teen birth rate (43).

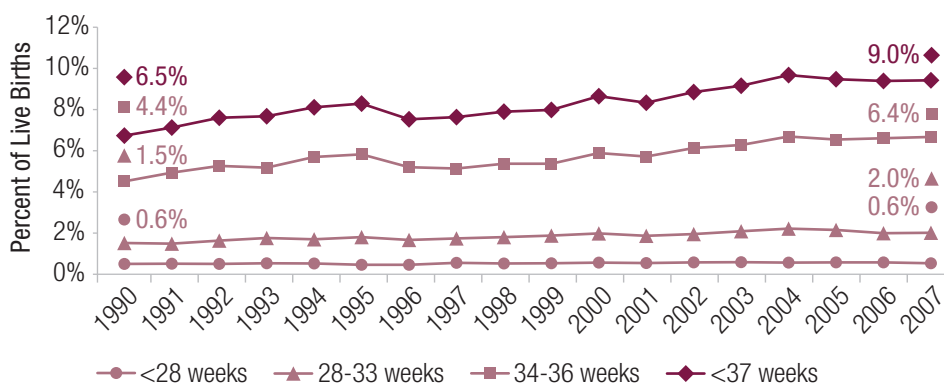
However, although the overall teen birth rate is declining, significant racial and ethnic disparities persist. In 2007, Hispanic and Black women had the highest teen birth rates, while Whites and Asians had significantly lower rates.

**Hispanic and Black women had the highest teen birth rates.**

## Preterm and Low Birthweight Births

Preterm birth (less than 37 weeks gestational age) is a serious health problem and a leading cause of infant deaths. Infants who survive a preterm birth are at increased risk of lifetime health challenges, such as breathing

Figure 5.4 Trends in Preterm Delivery Rates by Gestational Age



Source: MDPH Birth File, 1990-2007.

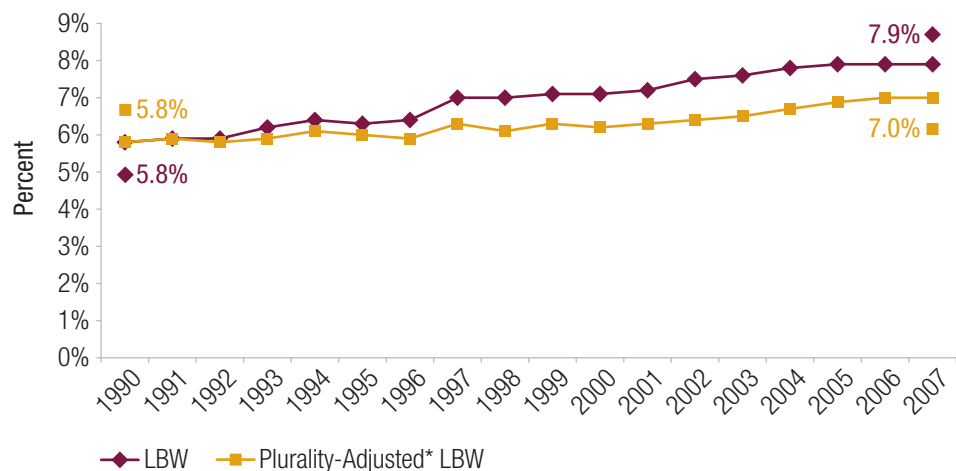
problems, mental retardation and other conditions. Even babies born just a few weeks too soon (34-36 weeks gestation, also known as late preterm birth) have higher rates of death and disability than full-term babies.<sup>1</sup>

The proportion of preterm births has increased 38% since 1990, although this proportion has been stable at 9% over the past three years. More than 70% of all preterm births in 2007 were late preterm births.

Low birthweight infants (LBW, weighing less than 2,500 grams or 5.5 pounds) are at increased risk of medical problems and death compared with infants of normal weight, and are at higher risk of delayed development and poor school achievement later in life.

LBW births have increased substantially since 1990, but have remained stable at 7.9% over the past three years. Much of the long-term increase in LBW is due to an increase in multiple births. Multiple births accounted for 13% of LBW births in 2007.

Figure 5.5 Trends in Low Birthweight Births



Source: MDPH Birth File, 1990-2007.

\*The yellow chart line shows what LBW rates would have been had the percent of multiples not increased.

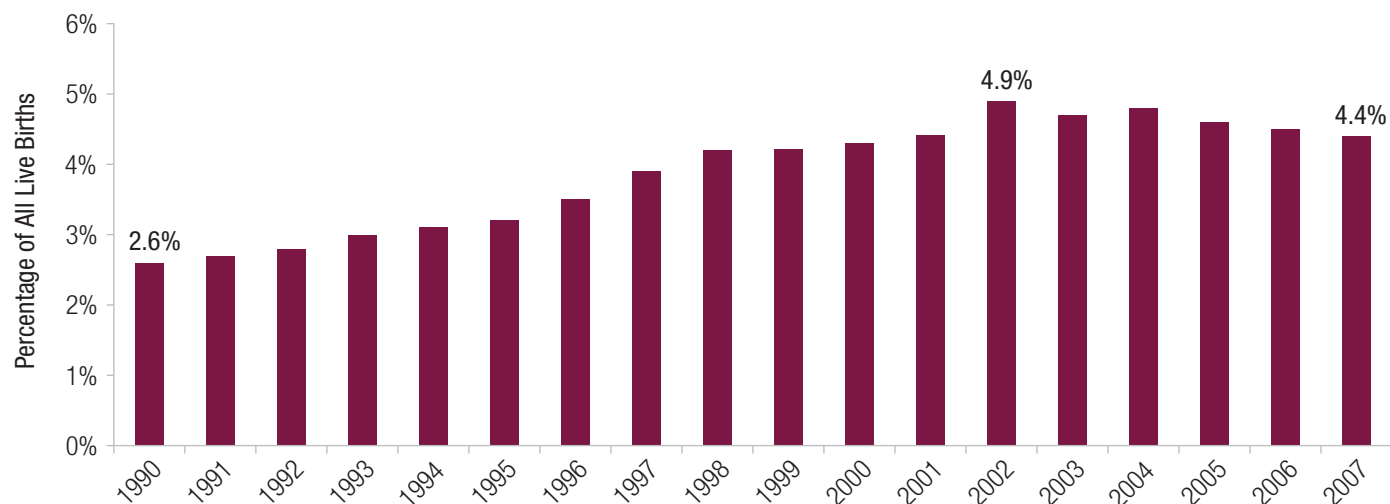
## Multiple Births and Fertility Treatments

The percentage of births that were multiples increased steadily from 1990-2002, but has declined slightly in recent years. In 2007, 95.6% of Massachusetts births were singletons, 4.2% were twins, and 0.2% were triplets or higher order multiples.

Women who undergo treatment for infertility are more likely to deliver multiple births than women who conceive without such treatments.<sup>2</sup>



Figure 5.6 Trends in Multiple Births



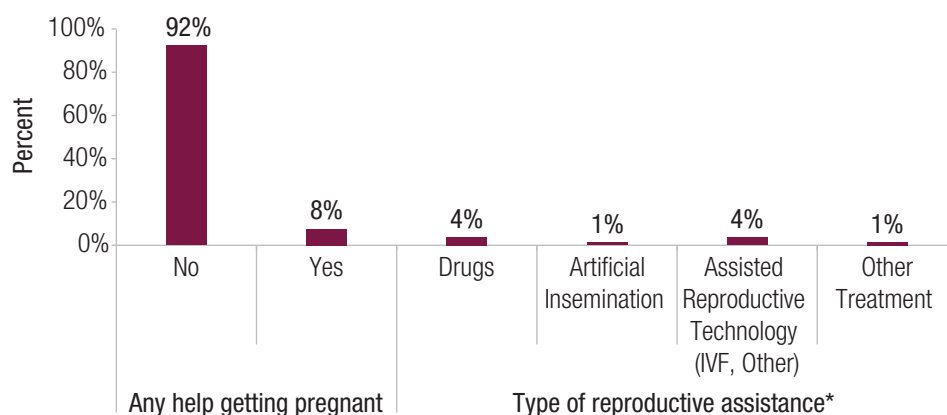
Source: MDPH Birth File, 1990-2007.

Fertility treatments include infertility drugs, artificial insemination, and assisted reproductive technologies (ART), in which both egg and sperm are manipulated outside the body.

Massachusetts is one of only 14 states with mandated private insurance coverage for fertility treatments. As a result, Massachusetts has the highest proportion of ART procedures per population in the US.<sup>3</sup>

Data from Massachusetts PRAMS (Pregnancy Risk Assessment Monitoring System) reveal that 8% of mothers giving birth in 2007 reported receiving some form of assistance from a health care provider in becoming pregnant. Fertility drugs and ART were each used in 4% of pregnancies.

Figure 5.7 Types of Fertility Treatment



Source: Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS), 2007.

\*Some women received more than one type of treatment.

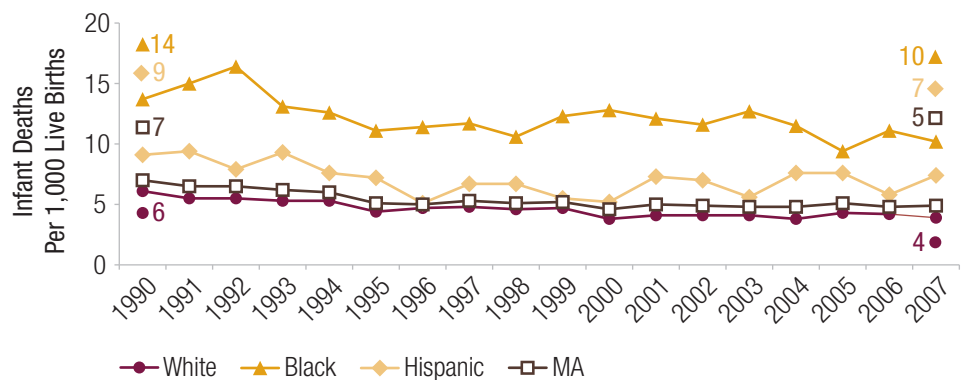
## Infant and Fetal Mortality

Infant mortality refers to the death of an infant prior to one year of age from any cause. The infant mortality rate (IMR) is calculated as the number of infant deaths per 1,000 live births.

In Massachusetts, the overall IMR has decreased by 30% since 1990. However, significant racial and ethnic disparities persist.

In 2007, the IMR for Blacks was 2.6 times the White rate. The IMR for Hispanics was 1.9 times the White rate.

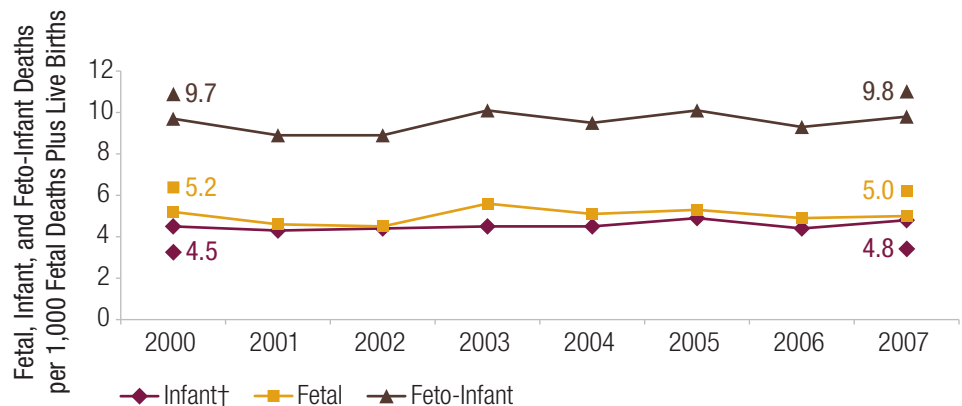
Figure 5.8 Trends in Infant Mortality



Source: MDPH Linked Birth-Death File, 1990-2007.

MDPH tracks data on fetal deaths that are 20 weeks gestational age or greater or 350 grams or greater. The fetal death rate has been slightly higher than the IMR and higher than the Healthy People 2010 fetal mortality rate goal of 4.1 each year since 2000.<sup>4</sup> The Massachusetts fetal

Figure 5.9 Trends in Fetal, Infant and Feto-Infant Mortality



Source: MDPH Linked Birth-Death File, 1990-2007.

death rate of 5.0 in 2007 was 20% lower than the US fetal mortality rate of 6.22 in 2005 (the most recent year for which national data are available).<sup>5</sup>

**Prenatal Care**

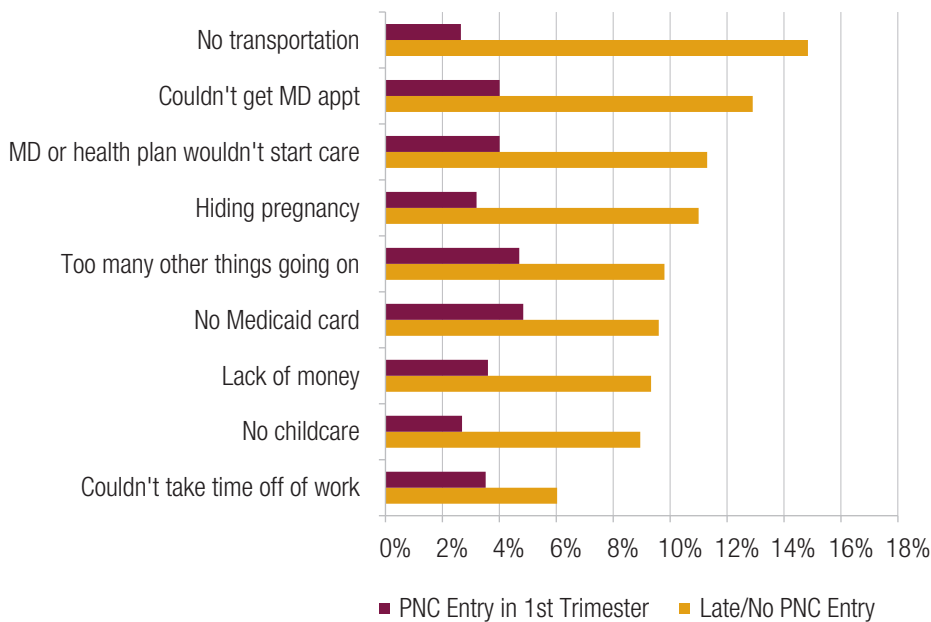
Entry to prenatal care (PNC) in the first trimester of pregnancy is recommended because of its potential to improve the health of mothers and infants.

The Adequacy of Prenatal Care Utilization (APNCU) Index<sup>6</sup> describes several aspects of PNC, including the timing of entry to care and the volume of care received.

According to data from the 2007 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS), more than 85% of women began PNC during the first trimester of pregnancy, and more than 80% received PNC deemed “adequate” or “adequate plus” according to the APNCU.

According to PRAMS data, one out of 5 women giving birth in Massachusetts in 2007 reported experiencing at least one barrier to receiving PNC during her pregnancy. Women experiencing at least one barrier to receiving PNC were almost three times as likely to receive late or no PNC compared to women experiencing no barriers.

Figure 5.11 **Barriers to Obtaining Prenatal Care**



Source: MDPH Pregnancy Risk Assessment Monitoring System (PRAMS), 2007.

Figure 5.10a **Timing of Entry to Prenatal Care (PNC)**

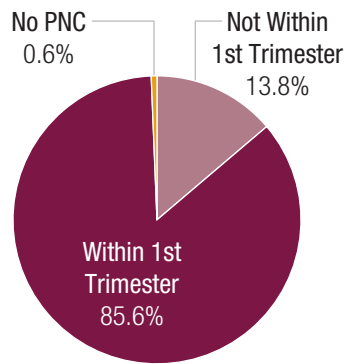
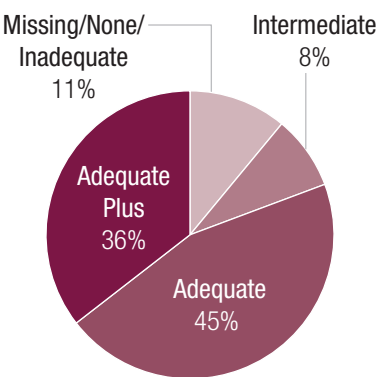


Figure 5.10b **Adequacy of Prenatal Care (PNC)**



Source: MDPH Pregnancy Risk Assessment Monitoring System (PRAMS), 2007.

**The Healthy People 2010 target is that at least 90% of women receive PNC before the end of the first trimester of pregnancy.<sup>4</sup>**

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## Gestational Diabetes Mellitus (GDM)

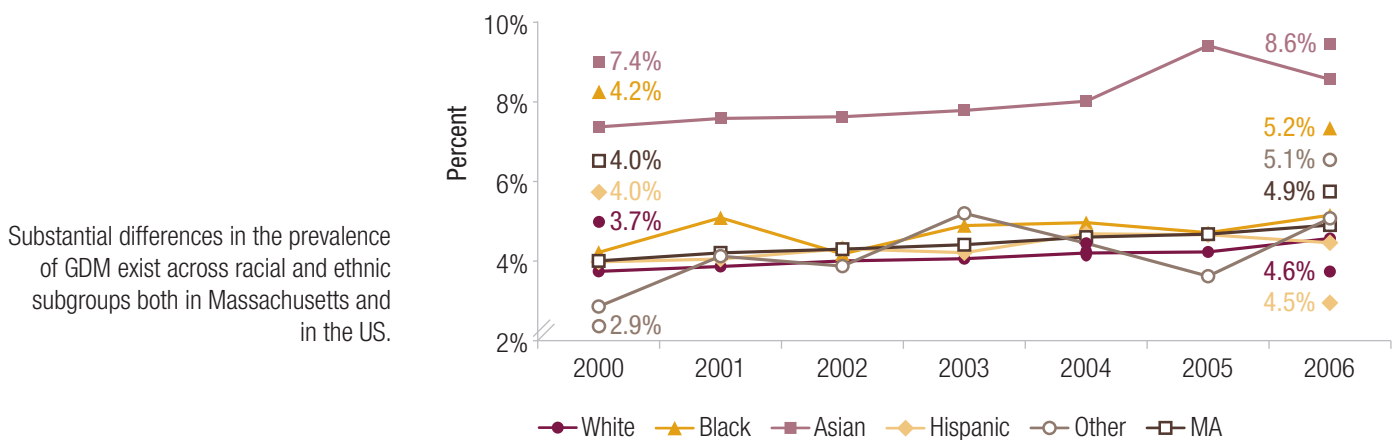
Gestational diabetes mellitus (GDM) is any degree of glucose intolerance with onset or first recognition during pregnancy.<sup>7</sup>

GDM can result in poor outcomes for the mother and baby during pregnancy, and can increase the risk that both mother and child develop type 2 diabetes later in life.

Known risk factors for GDM include advanced maternal age, obesity, and family history of diabetes.<sup>8</sup> The GDM prevalence in Massachusetts has increased nearly 23% in recent years, from 4.0% in 2000 to 4.9% in 2006, mirroring an increasing national trend.

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Figure 5.12 Trends in Gestational Diabetes Mellitus (GDM)



Source: MDPH Pregnancy to Early Life Longitudinal (PELL) Data System.

In 2006, Asian mothers had the highest prevalence of GDM (8.6%), followed by other, non-Hispanic (5.1%); Black (5.2%); White (4.6%); and Hispanic (4.5%) mothers.

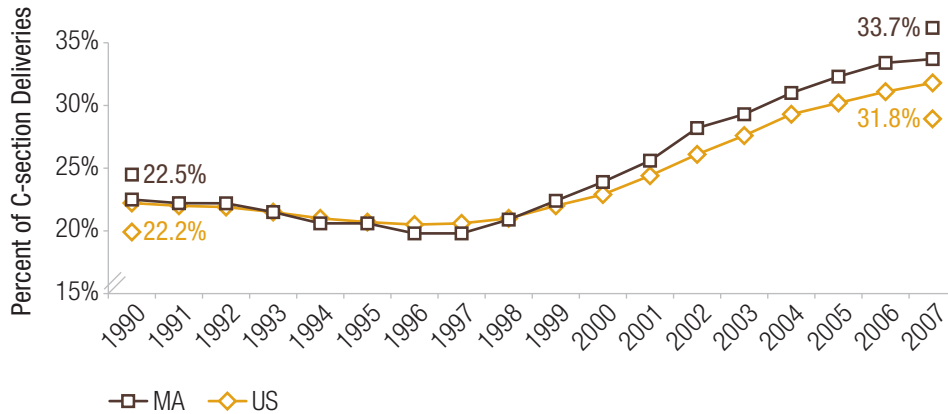
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## Method of Delivery

The percentage of births delivered by cesarean section has increased rapidly both nationally and in Massachusetts. The proportion of Massachusetts births that were cesarean deliveries in 2007 (33.7%) was 8% higher than the national rate of 31%.

Health experts have debated the causes of increasing cesarean deliveries for years. These include the increasing age and medical risks of childbearing women, the rising number of multiple births, differing opinions about the advisability of a vaginal birth after a previous cesarean delivery, malpractice concerns among providers, and the choice of more women to voluntarily

Figure 5.13 Trend in Cesarean Delivery Rate



Source: MDPH Birth File, 1990-2007.

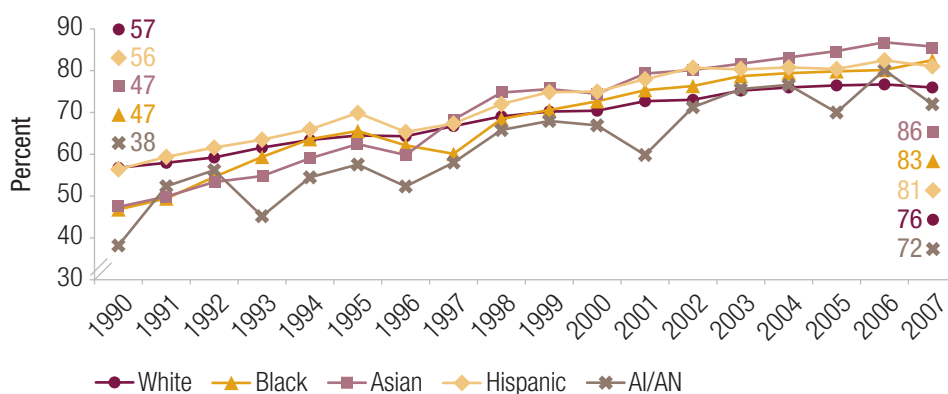
undergo cesarean deliveries. The rate of cesarean deliveries has increased even among women with no documented risks, including maternal medical conditions or complications of labor or delivery.

## Breastfeeding

Breastfeeding has known health benefits for both mother and infant. Improved breastfeeding initiation and duration rates are critical public health outcomes.

The Healthy People 2010 goal for breastfeeding initiation is 75%.<sup>4</sup> Massachusetts currently surpasses that goal. However, racial and ethnic disparities in breastfeeding exist.

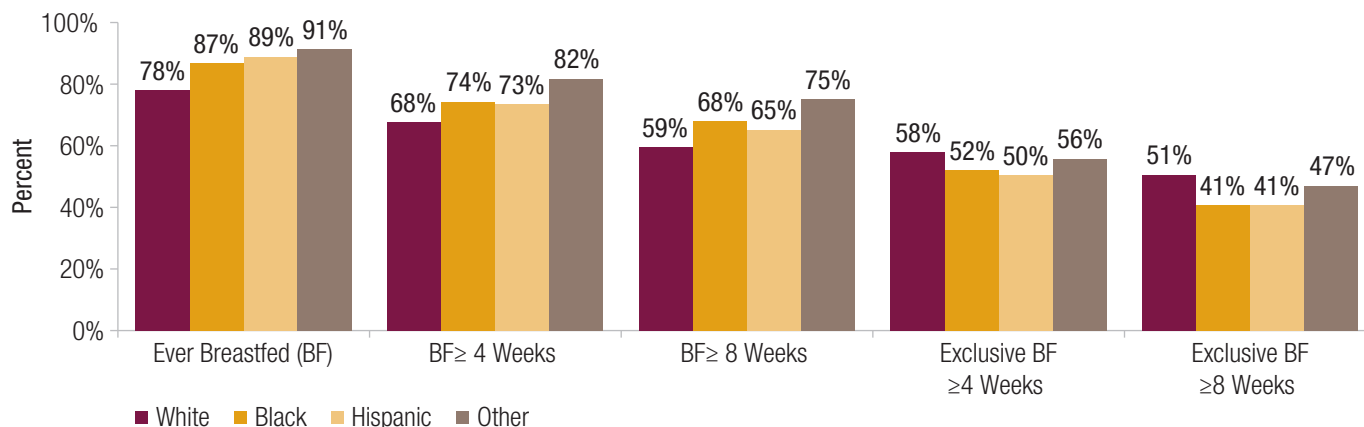
Figure 5.14 Trends in Breastfeeding Initiation by Race and Ethnicity



Source: MDPH Birth File, 1990-2007.

The prevalence of breastfeeding initiation, overall duration, and duration of exclusive breastfeeding as measured on the Massachusetts PRAMS survey varied by race and ethnicity.

Figure 5.15 Breastfeeding Initiation, Duration and Exclusivity



Source: MDPH Pregnancy Risk Assessment Monitoring System (PRAMS), 2007.

The highest rates of breastfeeding initiation and duration to 4 and 8 weeks were among other, non-Hispanic mothers, and the lowest among White mothers. However, White mothers were more likely than all other groups to *exclusively* breastfeed for at least 4 or 8 weeks.

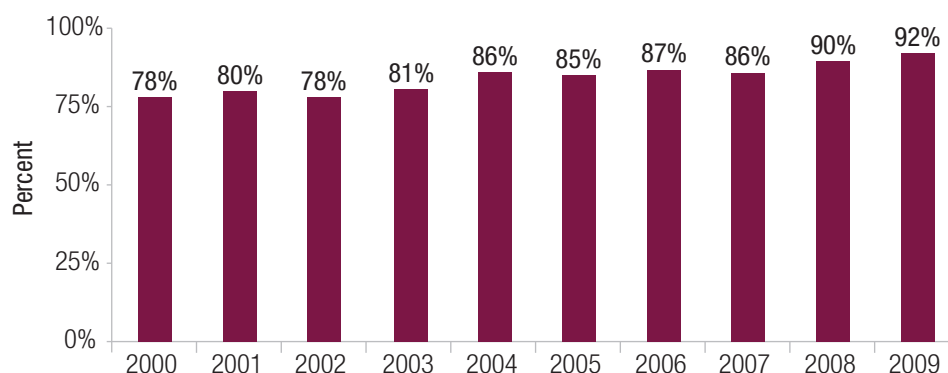
### Women Infants and Children (WIC) Nutrition Program

The Women Infants and Children (WIC) Nutrition Program is a state- and federally-funded health and nutrition program serving low to moderate income women, infants and children under age five years who have, or are at risk of developing, nutrition-related health problems.

Since June 2009, applications to WIC have increased dramatically, with operations at capacity, as more low-to-moderate income families in Massachusetts felt the strain of the economic downturn and needed help in order to provide their families with nutritious food.

Figure 5.16 Eligible Women, Infants and Children served by WIC

**WIC currently serves 92% of individuals estimated as eligible by the Massachusetts WIC 2009 Needs Assessment.**



Source: MDPH Women Infants and Children (WIC) Nutrition Program, 2000-2009.



Figure 5.17 WIC Participation During Pregnancy by Socio-Demographic Characteristics

Characteristic	Subgroup	Weighted %
Maternal race/ethnicity	White	25.7
	Black	70.3
	Hispanic	79.3
	Other	39.3
Maternal age (years)	<20	87.5
	20-29	54.2
	30-39	19.4
	40+	17.5
Maternal education	< High school	84.5
	High school diploma	64.5
	Some college	45.6
	College graduate	9.5
Household poverty level	>100% FPL	21.6
	≤ 100% FPL	85.7
Maternal nativity	Non-US born	55.2
	US born	30.5
Marital status	Married	17.3
	Unmarried	78.4

Source: MDPH Pregnancy Risk Assessment Monitoring System (PRAMS), 2007.

WIC currently serves 92% of individuals estimated as eligible by the Massachusetts WIC 2009 Needs Assessment.

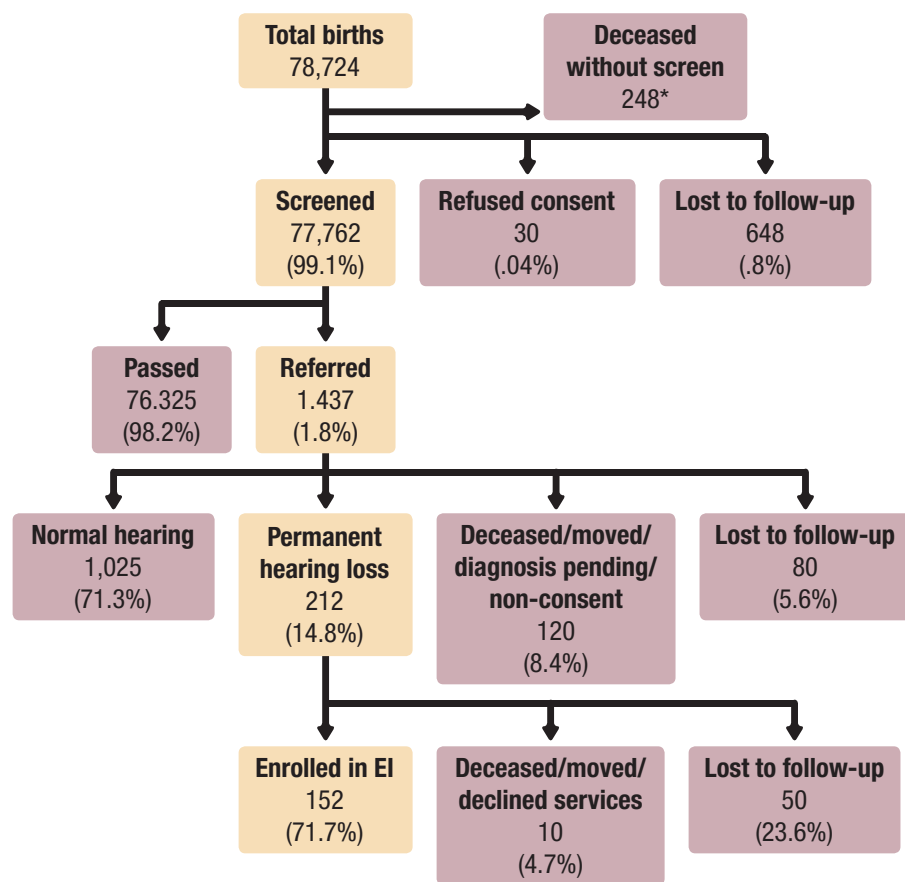
PRAMS data reveal that more than 38% of mothers with live births in 2007 participated in the WIC program during pregnancy. The highest rates of WIC participation were among women who were Hispanic (79.3%), under age 20 years (87.5%), had less than high school education (84.5%), living in poverty (85.7%), non-U.S. born (55.2%), and unmarried (78.4%).

## Newborn Hearing and Blood Screening

When babies who are deaf or hard of hearing are identified early, intervention can have a dramatic, positive impact on speech, language, and overall development. Massachusetts law mandates hearing screening for all newborns, and the Universal Newborn Hearing Screening Program (UNHSP) ensures that families receive screening and follow-up services.

More than 99% of infants born in Massachusetts in 2007 were screened for hearing loss. Among those screened, 1.8% failed and were referred for a follow-up audiologic diagnostic evaluation. Among 1,437 children referred, 14.8% were diagnosed with permanent hearing loss.

Figure 5.18 Screening, Diagnostic and Early Intervention Data



\*"Deceased without screen" category not included in further denominators

Source: Universal Newborn Hearing Screening Program (UNHSP), Massachusetts Department of Public Health, 2007.

Approximately 72% of these children were enrolled in the Early Intervention Program (see EI section below).

The New England Newborn Screening Program is a comprehensive public health program that provides screening, clinical follow-up, and research to prevent or minimize the effects of disorders that can lead to death, mental retardation, and life-compromising conditions in newborns.

In 2008, a disorder was detected in 0.3% of the 77,345 infants screened (Figure 5.19).

## Birth Defects

Birth defects contribute substantially to premature births and are the leading cause of infant death nationally. Among the 155,284 live births to Massachusetts residents in 2004-2005, 2,536 had one or more structural birth defects. In addition, 54 stillbirths were identified with a birth defect.

Figure 5.19 Disorders Detected by Newborn Screening, 2008

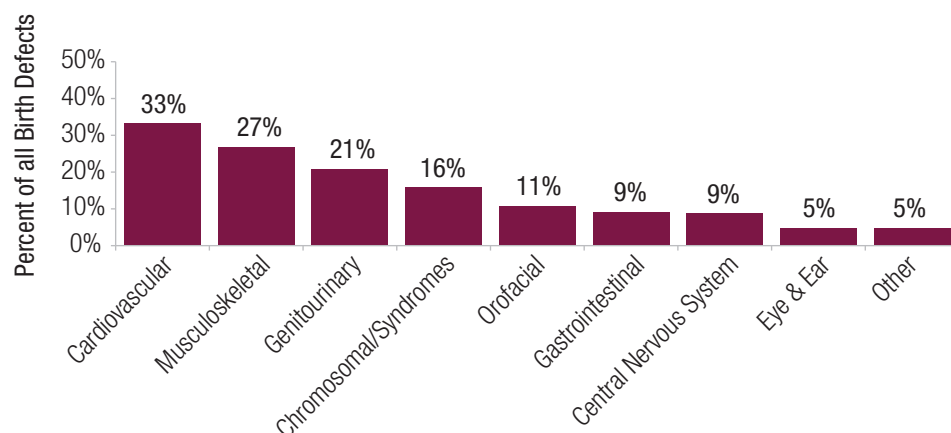
Infants Screened	
Born in MA	77,345
Disorders Detected by Screening	
Biotinidase Deficiency	4
Toxoplasmosis	3
Congenital Adrenal Hyperplasia	5
Congenital Hypothyroidism	65
Galactosemia (Classical and Duarte)	19
Cystic Fibrosis	15
Hemoglobinopathies:	
Sickling	35
Non-Sickling	26
Amino Acid Disorders:	9
Fatty Acid Oxidation Disorders:	
Short-chain acyl-CoA dehydrogenase deficiency	7
Other Fatty Acid Oxidation Disorders	7
Urea Cycle and Organic Acid Disorders	10
<b>Total</b>	<b>205</b>

Source: New England Newborn Screening Program, 2008.

Overall, 1.7% of births in the state (166.8 per 10,000 live births) were identified as having one or more birth defects.

Cardiovascular birth defects are the most commonly occurring birth defects and contribute more to infant deaths than any other category. Of the ten most common birth defects in 2004-2005, three (atrial septal defects, ventricular septal defects, and valvular pulmonary stenosis) were cardiovascular in nature. Common non-cardiovascular defects included Down syndrome, polydactyly/syndactyly, hypospadias, clubfoot, and orofacial clefts.

Figure 5.20 Common Birth Defects

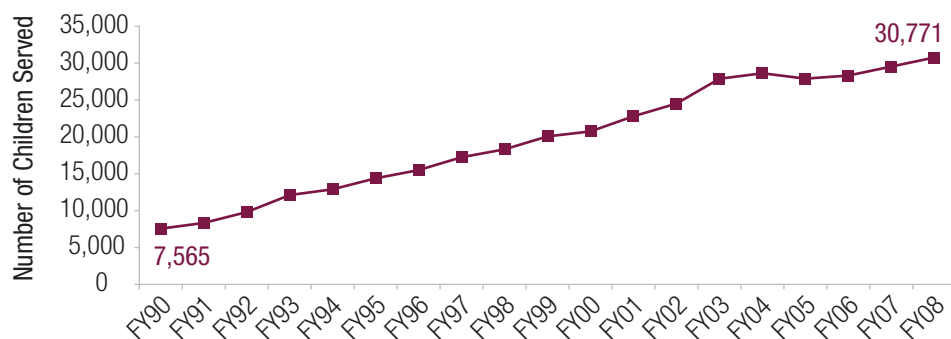


Source: MDPH Birth Defects Monitoring Program, 2004-2005.

## Early Intervention Program

Early Intervention (EI) provides family-centered services that facilitate the progress of children with certain developmental delays (e.g., significant speech delays), established conditions (e.g., Down syndrome), or for

Figure 5.21 Children Served in the Early Intervention Program



Source: MDPH Early Intervention Program.

In SFY90, the Early Intervention program served 7,565 children. In SFY08, this number had increased by more than 300% to 30,771.

whom typical development is at risk due to certain birth or environmental circumstances (e.g., living in a home where substance abuse is present). Eligible children receive services from birth to age three years to acquire the skills they need to participate more easily in their everyday activities and with their peers. Services are provided to the child and family in “natural settings,” which can include individual treatment in family homes and child care settings, or group sessions in natural settings throughout the community such as community play groups or libraries.

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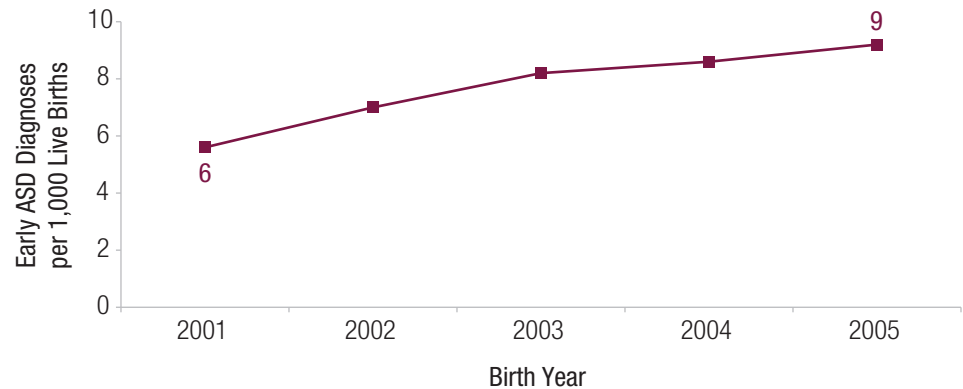
## Autism Spectrum Disorders

Autism spectrum disorders (ASD) are complex developmental disabilities characterized by impairments in a person’s ability to communicate and interact with others. Early identification of ASDs and early intervention can improve developmental outcomes.

Early treatment for ASD is available through state-coordinated EI services, mandated under part C of the Individuals with Disabilities Education Act (IDEA ‘97). The MA EI Specialty Services Program was created in 1998 to address the unique service needs of children with ASD.

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Figure 5.22 Trends in Autism Spectrum Disorders



Source: Massachusetts Pregnancy to Early Life Longitudinal (PELL) Data System.

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ASD diagnoses among children aged 36 months or less in the EI Program have increased from approximately one in 179 among the 2001 birth cohort to one in 109 among the 2005 birth cohort.

The most recent CDC estimate of the prevalence of ASDs from a multi-state study is one in 150 children aged 8 years, with a median age at first documented diagnosis ranging from 49-66 months.

In 2007, the American Academy of Pediatrics recommended routine screening of all children at age 18 and 24 months for ASD.<sup>9</sup>

Our finding of one in 109 children diagnosed with an ASD before age 36 months demonstrates the success of the EI program at promoting the early identification of ASD children for referral to appropriate services.



**Milton Kotelchuck, PhD, MPH**

Chair Emeritus and Professor, Community Health Sciences,  
Boston University School of Public Health

**T**he reproductive and infant health status in Massachusetts overall is very positive, especially compared to U.S. national rates. Massachusetts has benefited from many years of effective sustained public and private initiatives. However, there is still much room to improve our reproductive health. Too many of our children start life in less than optimal health. The reproductive health trends for Massachusetts and the nation are not moving in a positive direction. Infant Mortality rates have ceased improving since 2000. Low birthweight and prematurity rates have steadily worsened for the past decade, increasing the need for more special health and educational services.

Seven MA trends are particularly noteworthy:

- 1) Massachusetts births, like those in the rest of the United States, are growing more diverse, both in terms of racial/cultural ancestry and maternal age distribution. These trends will require substantial adaptations by our current clinical and public health programs.
- 2) Disparities in reproductive outcomes remain glaring. Ameliorative efforts have increasingly turned to addressing the health of women over their life course especially before pregnancy rather than the services they receive while pregnant. This approach is captured by the phrase: “You can’t cure a life time of ills during nine months of a pregnancy”. Moreover, disparities in reproductive health reflect the larger world of racial and economic inequities. Efforts to address the economic needs of families with newborn children – through paid parental leave or European-modeled programs of family support – are notably absent in Massachusetts and in the U.S.
- 3) The rapidly rising rates of gestational diabetes likely reflect the current obesity and diabetes epidemics in Massachusetts and in the U.S. Gestational diabetes puts both the infant and mother at substantially higher risk for subsequent morbidity. Programmatic and clinical efforts to address gestational diabetes and obesity pre- and post-delivery are under-developed in Massachusetts.
- 4) High levels of clinical technology are associated with births in Massachusetts. More than one third of births are delivered by C-Section, one of the highest rates in the US. This rate is still rising.



The number of births associated with assisted reproductive technologies (ART) is also one of the highest in the U.S., as is our multiple birth rate. Debates continue over the proper balance of natural versus technology-assisted birthing in MA.

5) Too many births (42%) in Massachusetts are unplanned, and more than 30% are not desired at the time of conception or at all (PRAMS, 2007). While Massachusetts has a relatively positive record on teen pregnancies, Hispanic populations have extremely high teen pregnancy rates, and almost all teen pregnancies are unplanned. Family planning and sexuality education must continue to be part of a comprehensive Massachusetts reproductive health policy.

6) The Massachusetts stillbirth rates are now higher than the state's neonatal and infant mortality rates. Massachusetts pays too little attention to stillbirths and earlier miscarriages. These are all tragic losses for parents.

7) Massachusetts provides extensive reproductive and early childhood services. While these assure our state's relatively positive reproductive health record, negative birth trends will increase pressure in upcoming years to further expand Early Intervention services, already utilized by nearly 15% of Massachusetts children aged zero to three. The rising Autism rates are particularly alarming.

Massachusetts can not rest on past laurels. Our enviable reproductive and infant health record is not immune to negative trends seen across the nation. Each new pregnancy challenges us to assure that every woman, family, and developing child has the opportunity for optimal reproductive and infant health now.



# FIGURE NOTES

**Figure 5.9:** Infant mortality rate in this graph includes fetal deaths in the denominator unlike the conventional IMR. The fetoinfant mortality rate includes late fetal deaths (after 20 weeks) and deaths of infants less than one year of age. In this graph, fetoinfant, fetoinfant, and infant mortality rates include all deaths (including those with unknown birthweight). The fetal mortality rate and infant mortality rate may not equal the fetoinfant mortality rate due to rounding.

**Figure 5.12:** The Pregnancy to Early Life Longitudinal (PELL) Data System contains birth certificates (BC) linked with delivery-related hospital discharge records. GDM information is ascertained from both data sources. The annual prevalences of GDM presented here are higher than those presented in other publications that use BC data alone.

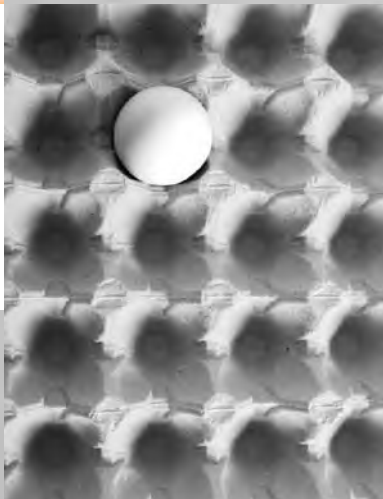
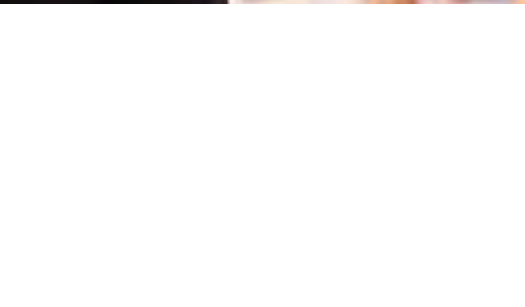
**Figure 5.16:** The percent of eligibles served is for all women, infants and children. The percents are calculated by taking the active statewide caseload and dividing by the estimated eligibles from the MA Needs Assessment Data for that fiscal year.

**Figure 5.17:** To examine differences in health by household income level, each respondent's household Federal Poverty Level (FPL) was approximated using self-reported income (as a range) and the number of dependent household members, and comparing these to the 2007 Department of Health and Human Services Federal Poverty guidelines (DHHS, 2007). Because exact dollar amounts were not reported by respondents, the mid-point of each income range was used to approximate household income. Thus, the estimated household poverty level should be viewed as approximate, and may misclassify some households.

**Figure 5.20:** Birth defects data are from the Massachusetts Birth Defects Monitoring Program. Denominator data are from the Massachusetts Registry of Vital Records and Statistics birth certificate file. For detailed information on inclusion and exclusion criteria, please visit the Massachusetts Center for Birth Defects Prevention and Research website at ([www.mass.gov/dph/birthdefects](http://www.mass.gov/dph/birthdefects)).

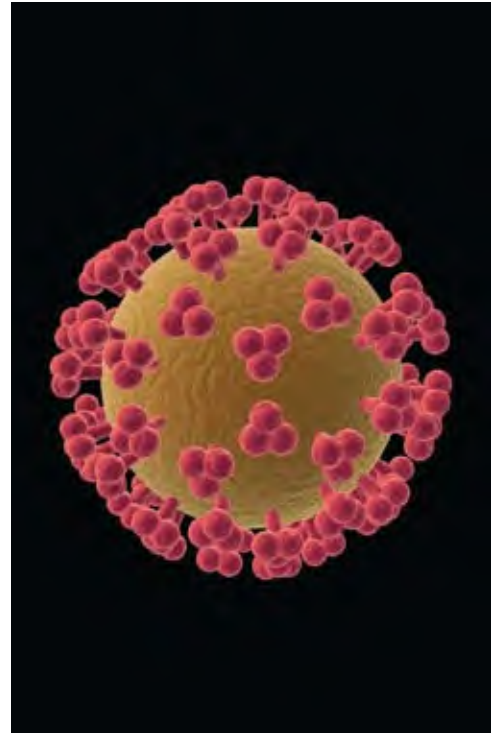
# ENDNOTES

- 1 March of Dimes. Preterm Birth Rate Drops. March 18, 2009. Available at: <http://www.marchofdimes.com/peristats/whatsnew.aspx?id=37&dv=wn>.
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# Infectious Disease



The Bureau of Infectious Disease Prevention, Response and Services is responsible for the prevention, surveillance and control of communicable and other infectious diseases. It accomplishes its mission through the application of disease reporting, surveillance, public education, epidemiologic investigation, disease intervention and provision of appropriate public health clinical services.

In the 1960s and 1970s, it was thought that infectious diseases were all but conquered in the United States through sanitation, vaccines, antibiotics and infection control. However, this optimism was short-lived, as new diseases emerged and old ones adapted to our efforts toward control and elimination.

In the past 30 years, certain diseases, such as HIV infection, Lyme disease, West Nile virus infection and others have demonstrated that new and newly recognized diseases can emerge or readily migrate to our shores. Widespread multi-state outbreaks of foodborne illness demonstrate that our food supply is still vulnerable to contamination despite our

sophisticated understanding of how foodborne illness occurs. “Old diseases”, such as tuberculosis, syphilis, whooping cough, and even mumps, pose new challenges to prevention and control.

Antimicrobial resistance in bacteria and viruses make treatment of infections more difficult and less effective. Healthcare-associated infections demonstrate the capacity of infectious diseases to flourish, even in what should be the most pristine environments. Due to wide-spread international airline travel, the rest of the world is only hours away, with infectious diseases such as malaria, tuberculosis, HIV infection and measles on our doorstep.

Prevention is key to reducing disease, death and further transmission of infectious diseases in the population. Prevention involves vaccines, clinical management, treatment, isolation, quarantine, behavior change, and improvement in the socioeconomic conditions under which people live.

Successful prevention and control of infectious diseases is built on a foundation of disease surveillance. Since the 19<sup>th</sup> century, Massachusetts has led the nation in disease surveillance. In the 21<sup>st</sup> century, surveillance has become highly automated and efficient, yet the diversity of infectious diseases with their clinical, social and economic impacts, and the diversity of the populations affected, provide ongoing challenges for prevention programs and clinical services. Vigilance is required to recognize outbreaks of disease and implement epidemiologic investigation and measures of control for effective response.

Disease surveillance is defined as the ongoing systematic collection and analysis of data and the provision of information leading to action to prevent and control disease. Surveillance data bring to light disease burden, outbreaks, trends and disparities in health outcomes. These data are also an important tool in assessing the impact of interventions to reduce disease occurrence. More than 90 infectious diseases and conditions are reportable to local boards of health and the Massachusetts Department of Public Health. Electronic methods of data collection and storage, including the Massachusetts Virtual Epidemiologic Network (MAVEN) and electronic laboratory reporting, have enhanced capacity to monitor communicable diseases in a more timely and complete fashion.

**Massachusetts has always  
had, and continues to have,  
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infant immunization in the  
United States.**

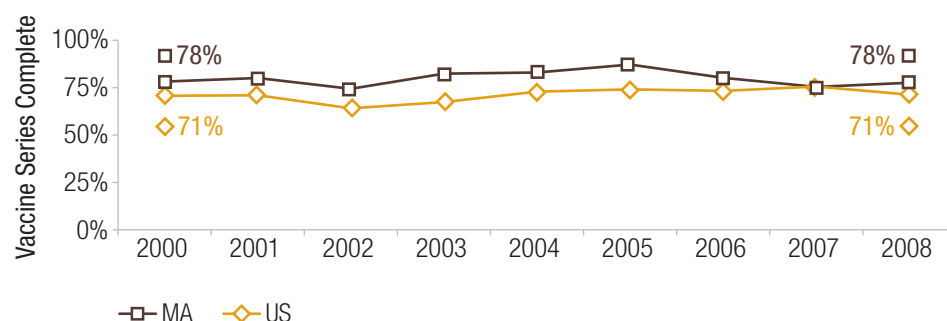
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### **Vaccine-Preventable Infections**

In the early 19<sup>th</sup> century, Massachusetts was among the first places in the world to virtually eradicate the dreaded disease smallpox through the effective use of vaccine. Immunization remains the most effective disease prevention intervention. Massachusetts has always had, and continues to have, one of the highest levels of infant immunization in the United States. This is a result of a unique combination of an effective pediatric primary care system that immunizes virtually all children in their medical home,



Figure 6.1 Vaccine Series Complete† at 24 Months



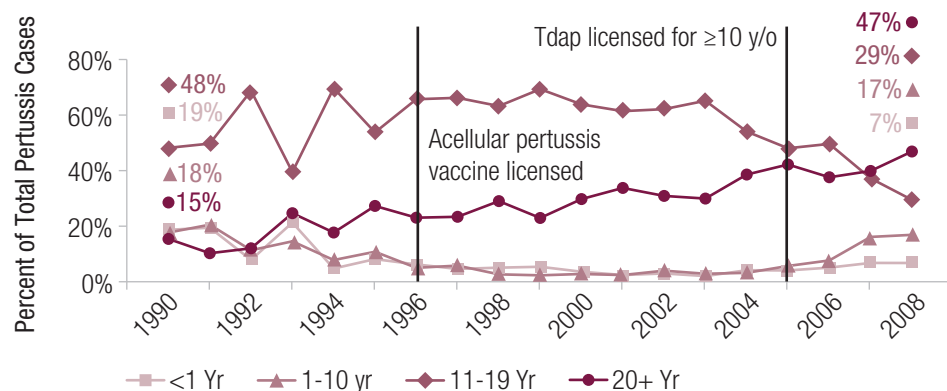
Source: CDC National Immunization Survey, 2000-2008.

and the state's provision of every recommended vaccine, for all young children, at no charge. The complex immunization schedule provides protection against a wider range of diseases, but also presents difficult issues of cost, distribution, administration, and tracking of vaccinations.

Most vaccine-preventable diseases of childhood have been essentially eliminated in Massachusetts. Beginning in the 1940s, widespread immunization against pertussis, or "whooping cough", led to marked reductions in disease and death due to this bacterial infection. However, pertussis still occurs, primarily in pre-teens, adolescents and adults, for whom old-style vaccines did not give long-lasting protection. The introduction, in 2005, of a new vaccine that can protect adolescents and adults from pertussis has decreased disease incidence and the proportion of infections in teens, who were the first target for this new vaccine.

Though whooping cough can be uncomfortable and inconvenient for older age groups, it can be very dangerous for infants too young to have completed the series of protective vaccination. These children are at risk of exposure from an infected parent or sibling, so preventing disease in the older age groups is important.

Figure 6.2 Pertussis Cases by Age



Source: MDPH Disease Surveillance System, 1990-2008.

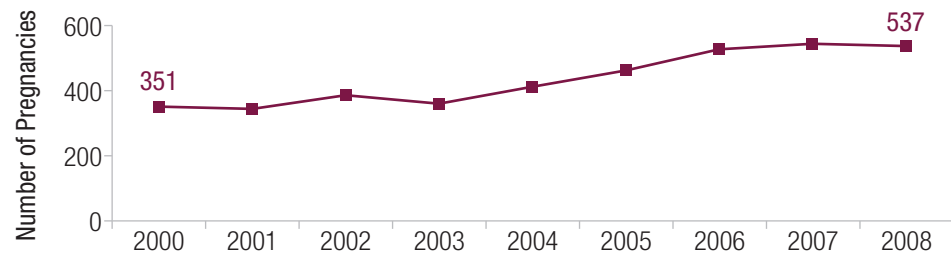
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## Disease Prevention, Response and Services, MDPH

In addition to pertussis, other vaccine-preventable diseases still present significant challenges. Pregnant women who carry hepatitis B virus can pass the virus to their newborns. Ninety percent or more of those newborns will develop life-long infection with the eventual risk for cirrhosis, liver failure, liver cancer and premature death. Identification of hepatitis B infection by testing women before or during pregnancy, and the prompt administration of vaccine and antibody against hepatitis B virus to the newborn at birth will prevent infection. The implementation of electronic laboratory reporting of hepatitis B test results and the MAVEN automated disease surveillance system has resulted in a 15% increase in the number of at-risk babies identified, and life-long infections prevented.

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Figure 6.3 Hepatitis B Positive Pregnant Women Identified in Massachusetts



Source: MDPH Disease Surveillance System, 2000-2008.

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### Salmonella infection

**continues to be a major  
foodborne illness, causing  
more than 1,000 reported  
cases in Massachusetts**

**every year.**

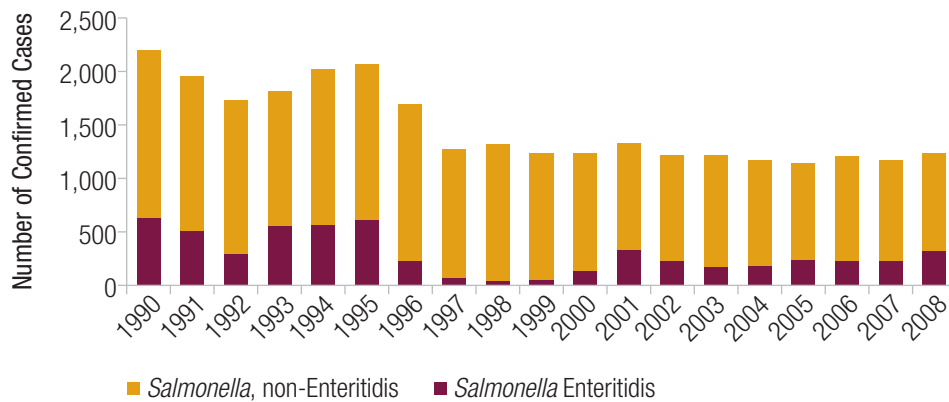
### Foodborne Illness

Better sanitation and increased food safety represent another public health success, but foodborne illness is still a threat. Stories about large multi-state outbreaks of salmonella infection and other foodborne diseases garner much attention, but these would not have been recognized without the work of public health laboratories. “Fingerprinting” the DNA of microorganisms allows investigators to identify relationships among cases that would not otherwise have been detected.

Salmonella infection continues to be a major foodborne illness, causing more than 1,000 reported cases in Massachusetts every year. Many more cases are not diagnosed because individuals do not seek medical attention or receive laboratory testing. Food safety training and programs can prevent salmonella cases, but outbreaks related to large-scale food sources (peanut butter, spinach, pot pies, etc.) are increasingly identified. Salmonella remains a major target of national programs to make food safer.

The impact of prevention programs can be seen in the reduction of egg-related Salmonella Enteritidis in the mid-1990s. There are more than 2,500 different *Salmonella* (serotypes) found worldwide. However, *S.*

Figure 6.4 **Confirmed Salmonellosis Cases**



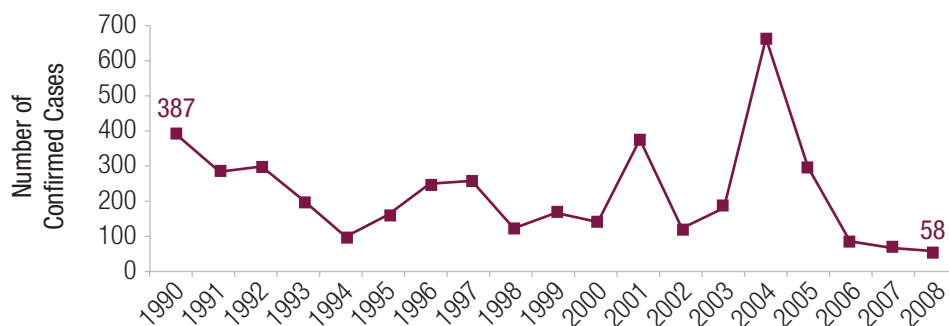
Source: MDPH Disease Surveillance System, 1990-2008.

Enteritidis accounts for a significant proportion of the reported cases in Massachusetts. Twenty years ago a major source of *Salmonella* Enteritidis infection was eggs and poultry. Action directed at reducing infection in poultry and information of safe foodhandling provided to the public reduced the proportion of infections due to this strain of *Salmonella*.

Hepatitis A is another foodborne threat that continues to present challenges to public health. Hepatitis A is an acute illness that affects the liver, but often has minimal or even no symptoms. Rarely fatal, it does not lead to long-lasting infection, but causes fever, tiredness, loss of appetite, stomach pain, nausea, diarrhea and jaundice. Hepatitis A virus is passed by the fecal-oral route and outbreaks occur through poor hygiene, food contamination, and intimate contact. Recent universal immunization of children against hepatitis A has been largely responsible for overall declines in incidence.

Three defined “outbreaks” occurred in recent years (Figure 6.5). Hepatitis A surveillance revealed an epidemic in 1995-1997 among men who have sex with men; an outbreak in 2001 was related to an infected food handler;

Figure 6.5 **Confirmed Hepatitis A Cases**



Source: MDPH Disease Surveillance System, 1990-2008.

and an outbreak in 2004-05 occurred among the homeless, substance users and the incarcerated. These outbreaks demonstrate the continued need for prevention efforts, educating food workers and others about proper hygiene and sanitary food handling.

### Insect and Tickborne Illnesses

Infectious disease threats in the environment also include diseases transmitted by ticks and mosquitoes. Changes in the way we live, where we live, and population density are central to the more than 10-fold increase in reported tickborne Lyme disease across the Commonwealth over the past 15 years.

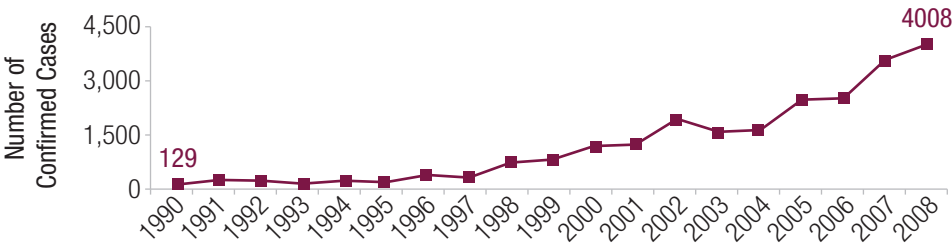
Even with these dramatic increases, we know that many cases are not diagnosed and that most cases are not reported; and thousands of people suffer with illness and potential complications, which can include joint, nerve, and heart problems. Other diseases transmitted by the deer tick are also increasing across the state. Lyme and other tickborne diseases can be prevented by tick avoidance, using tick repellents, and changes in the built environment such a keeping grasses cut short, removing low-lying branches from shrubbery, using deer fencing or choosing plants that do not attract deer.

Figure 6.7 **Confirmed Eastern Equine Encephalitis and West Nile Virus Cases**

Year	Number of Confirmed Cases (Deaths)	
	EEE	WNI
1990	3 (1)	N/A
1991	0 (0)	N/A
1992	1 (0)	N/A
1993	0 (0)	N/A
1994	0 (0)	N/A
1995	1 (1)	N/A
1996	0 (0)	N/A
1997	1 (0)	N/A
1998	0 (0)	N/A
1999	0 (0)	N/A
2000	1 (0)	N/A
2001	1 (0)	3 (1)
2002	0 (0)	22 (3)
2003	0 (0)	17 (1)
2004	4 (2)	0 (0)
2005	4 (2)	6 (1)
2006	5 (2)	3 (0)
2007	0 (0)	6 (0)
2008	1 (0)	1 (1)

Source: MDPH Disease Surveillance System, 1990-2008.

Figure 6.6 **Confirmed Lyme Disease Cases**



Source: MDPH Disease Surveillance System, 1990-2008.

Mosquitoes also transmit diseases across the Commonwealth. Eastern equine encephalitis (EEE), caused by a mosquito-transmitted virus, has a 40-50% mortality rate and a 90% rate of severe neurologic consequences in survivors. It was first described as a human infection in Massachusetts in 1938. Since that time, cases of this disease have continued to occur, primarily in cycles of seven to 19 years.

West Nile Virus infection, another mosquito-transmitted infection, did not occur in North America until 1999. Cases have occurred across the state since 2001. Surveillance, education, and prevention through reduction of mosquitoes and mosquito exposure are key elements of a multi-agency effort to reduce human risk and disease.

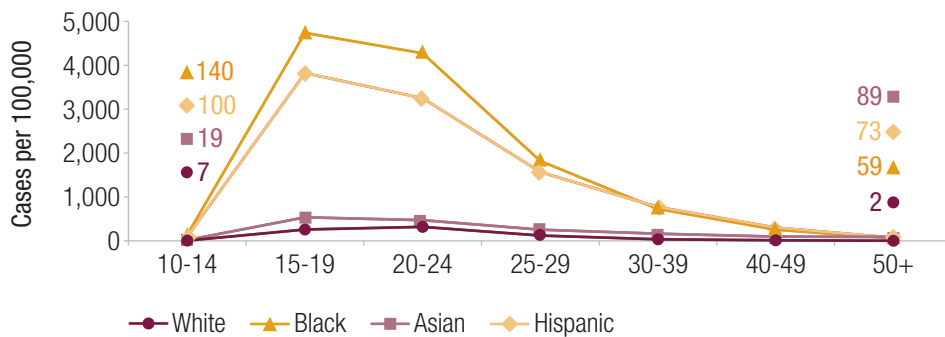
**Sexually Transmitted Infections**

Sexually transmitted infections are reportable directly to the Massachusetts Department of Public Health. Sexually transmitted bacterial infections, such as chlamydia infection, gonorrhea and syphilis require treating those infected and their sexual partners to prevent complications and further transmission. Left untreated, these diseases can lead to pelvic inflammatory disease, infertility, and in the case of syphilis, neurologic complications.

Syphilis tends to occur in older individuals, while chlamydia infection and gonorrhea are predominantly reported in teenagers and young adults. In 2008, 68% of chlamydia infections and 54% of gonorrhea cases were reported in persons under 25 years of age, an indisputable indicator of levels of unprotected sexual intercourse in these populations.

Comprehensive health education, including sexuality and sexually transmitted diseases, has been shown to be associated with reduced risk of sexually transmitted infection. Reported chlamydia infection has been increasing for 10 years which is attributable partly to successful screening of asymptomatic individuals. Racial and ethnic disparities in rates of chlamydia infection are present in all ages and are increasing. It is critical that appropriate educational and prevention efforts be put in place to address this threat to the health and fertility of the young.

Figure 6.9 Chlamydia Incidence by Age



Source: MDPH Disease Surveillance System 2008.

Although down from historic high levels in the 1960s, numbers of cases of reported gonorrhea have been essentially stable for the past five years, with little to no progress in control. Gonorrhea affects men and women nearly equally, and there are marked racial and ethnic disparities in the burden of infection, as seen with chlamydia infection. Appropriate educational and prevention programs are needed to control this serious sexually transmitted infection.

With the adoption of safer sex practices in the 1980s, and the control of a subsequent epidemic of syphilis among crack cocaine and other drug users

Figure 6.8a Chlamydia Infection by Age (N=17,434)

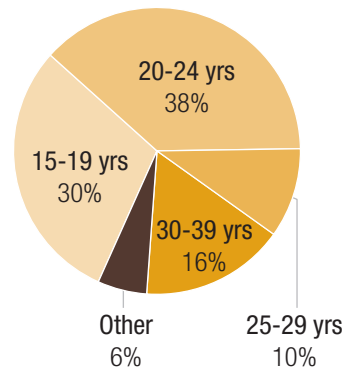
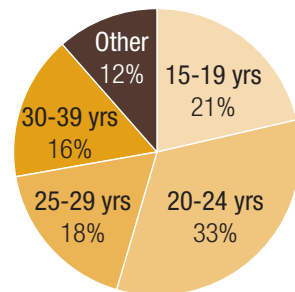
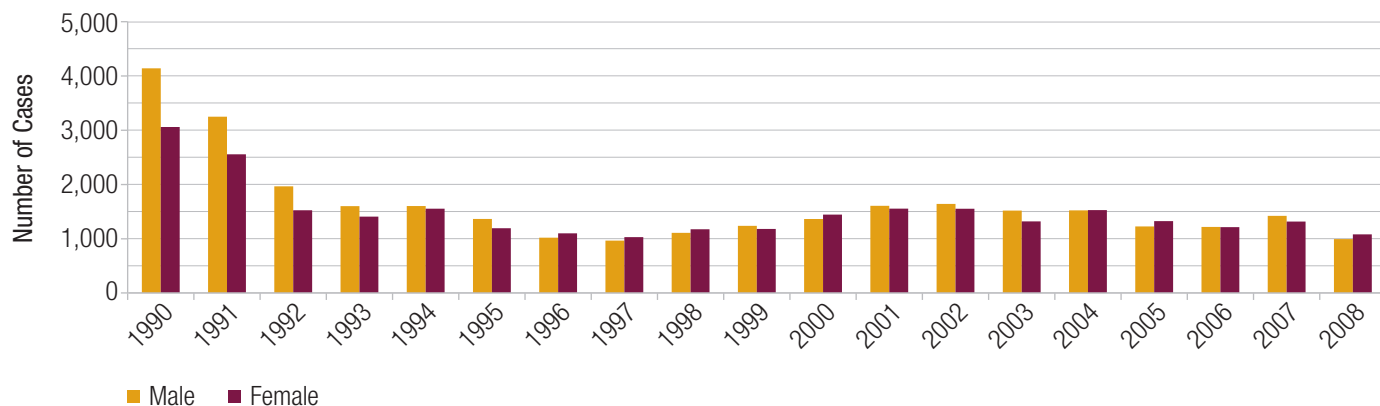


Figure 6.8b Gonorrhea Infection by Age (N=2,075)



Source: MDPH STD Surveillance System 2008.

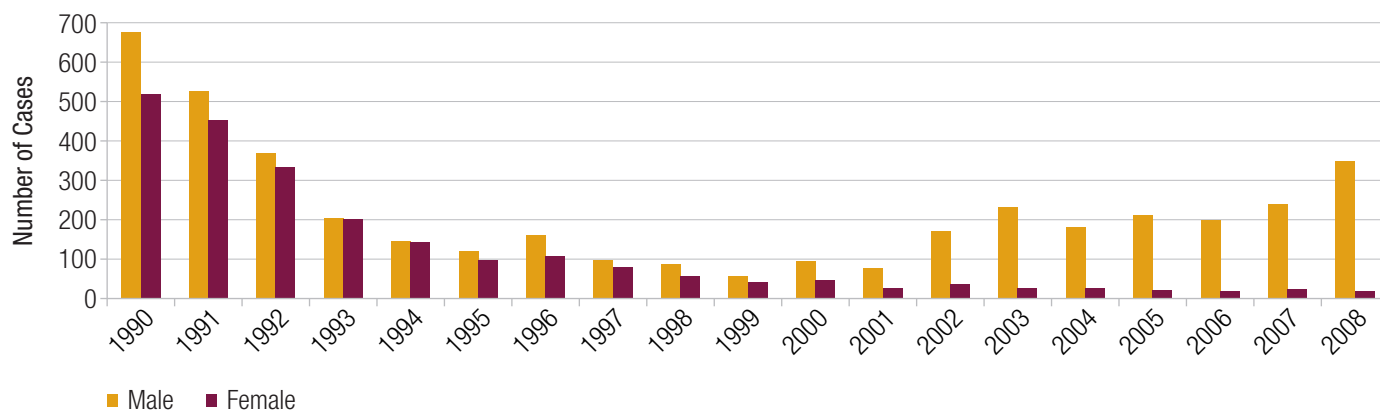
Figure 6.10 **Gonorrhea Cases by Gender**



Source: MDPH Disease Surveillance System, 1990-2008.

in the early 1990s, reported cases of early (infectious) syphilis reached record low levels in the late 1990s. However, since 2000, reported syphilis cases have increased in men, and in particular in men who have sex with men. The use of the Internet to find sexual partners, “prevention fatigue” among older men and the lack of an experience of the early impact of AIDS among younger men contributed to increased unprotected sex and syphilis. These conditions provide new challenges to the prevention and control of this sexually transmitted infection.

Figure 6.11 **Infectious Syphilis Cases by Gender**



Source: MDPH Disease Surveillance System, 1990-2008.

## HIV/AIDS

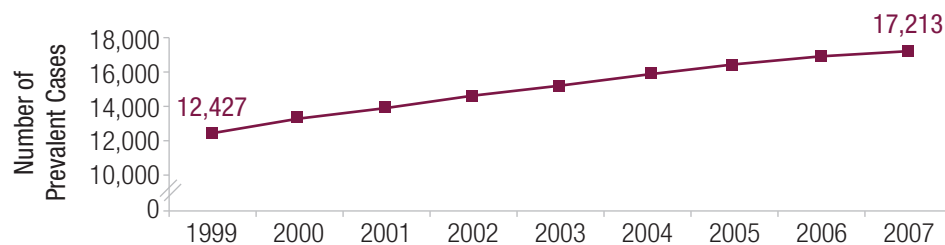
Infection with the human immunodeficiency virus (HIV) is transmitted through unprotected sex and the type of blood contact that comes with sharing contaminated injection equipment. Since the beginning of the epidemic, 29,797 persons have been reported with HIV/AIDS in



Massachusetts. As of December 31, 2008, a total of 17,540 (59%) of these individuals were living with HIV/AIDS, and as many as 8,000 others may be infected and not know they are infected.

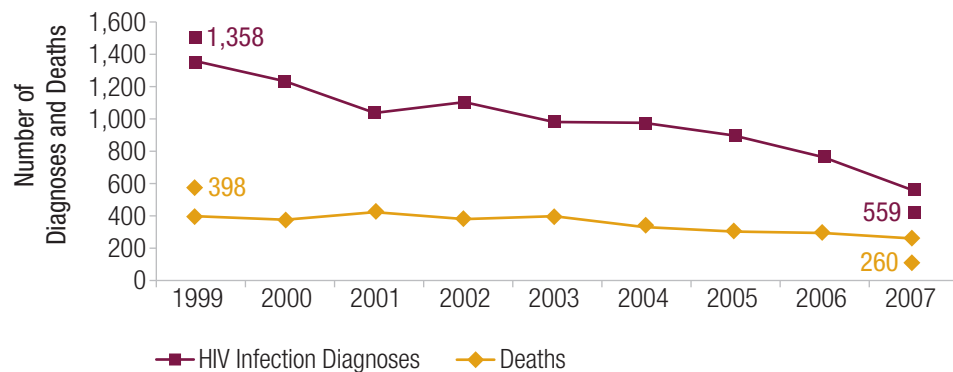
The number of people living with HIV/AIDS increased 38% between 1999 and 2007, and new HIV infection diagnoses exceeded the number of deaths each year. Between 2001 and 2006, newly reported HIV infections decreased by more than 25%, indicating the effectiveness of both prevention programs focused on HIV-risk behaviors and widespread treatment of HIV-infected individuals with antiviral medications, which can reduce their infectiousness. This trend appears to be extending into 2007.

Figure 6.12 **People Living with HIV/AIDS**



Source: MDPH Disease Surveillance System, 1999-2007.

Figure 6.13 **HIV Infection and Death among People Reported with HIV/AIDS**

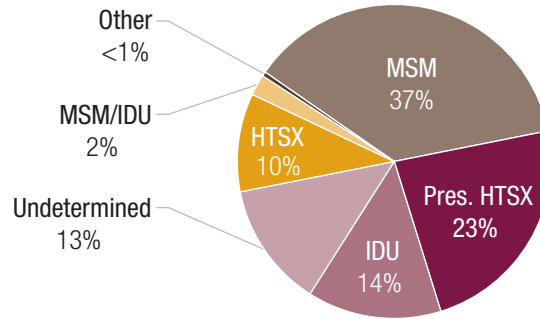


Source: MDPH Disease Surveillance System, 1999-2007.

The leading mode of exposure among persons recently diagnosed with HIV infection in Massachusetts was sexual behavior between men (37% of cases), sharing of injection drug equipment represents an additional 14% of cases. Ten percent of cases were identified as linked to heterosexual exposure with someone infected with HIV or at high risk of infection, while an additional 23% were due to presumed heterosexual sex with a person of unknown HIV status or risk profile.

With increased application of routine HIV testing in pregnancy and effective antiviral therapy, perinatal transmission of HIV infection to newborn babies has been virtually eliminated in Massachusetts.

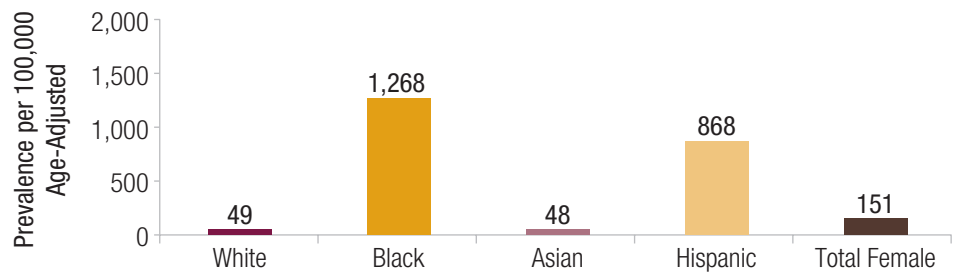
Figure 6.14 **Recent HIV Infection by Exposure Mode**



Source: MDPH Disease Surveillance System, 2005-2007.

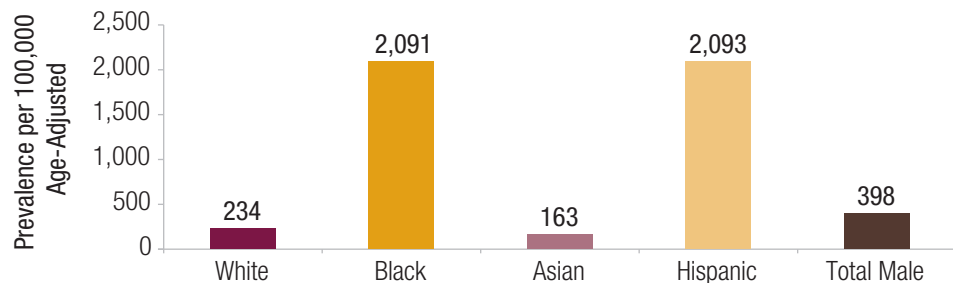
Significant racial and ethnic disparities exist in the distribution of HIV/AIDS. Among Whites, the rate of infection for men and women combined is 139 per 100,000 individuals. Age-adjusted rates among Blacks are 1,644 per 100,000 for men and women combined, a rate 12 times that of Whites. Among Hispanics, age-adjusted rates are 1,438 per 100,000 for men and women combined, a rate 10 times greater than that of Whites. However, these disparities manifest differently in men and women. HIV/AIDS rates for men are substantially higher than for women, yet racial and ethnic disparities exist for both genders.

Figure 6.15 **HIV/AIDS Prevalence Among Females**



Source: MDPH Disease Surveillance System.

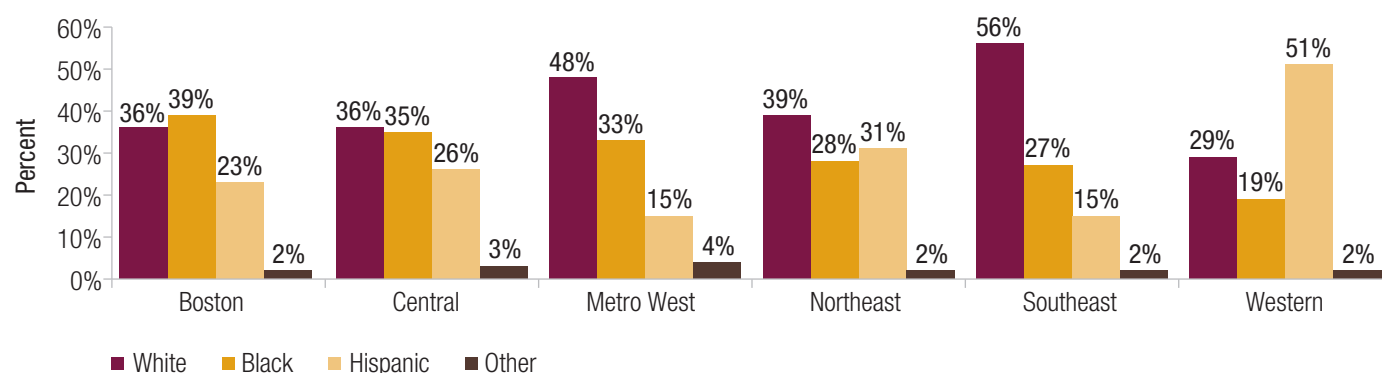
Figure 6.16 **HIV/AIDS Prevalence Among Males**



Source: MDPH Disease Surveillance System.

The distribution of HIV/AIDS by race, ethnicity and exposure varies widely across the Commonwealth. Those born outside the United States account for over 40% of people recently diagnosed with HIV infection in the Northeast and Metrowest areas of the state. In the Western part of the state, the largest proportion of newly diagnosed infections is among Hispanics. Men who have sex with men make up the largest proportion in the Boston, Metrowest and Southeast regions. The largest proportions of women are in the Western, Central, and Northeast regions. Injection drug use is the leading mode of exposure to HIV in the Western and Central regions.

Figure 6.17 **Recent HIV Infection By Health Service Region**



Source: MDPH Disease Surveillance System, 2005-2007.

Persons born outside the United States make up 12% of the population, but account for 20% of people living with HIV/AIDS and 30% of people recently diagnosed with HIV infection.

The differential impact of HIV/AIDS on communities of color demonstrates the critical need for culturally and linguistically appropriate prevention efforts.

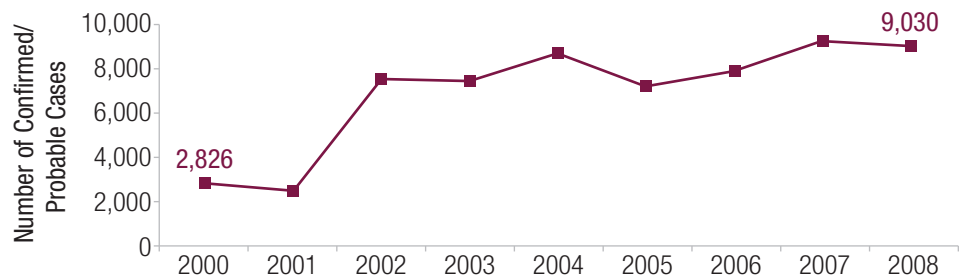
## Hepatitis C

Hepatitis C, similar to HIV infection, is transmitted through blood exposure, such as injection drug equipment sharing, needlestick injuries in health care settings, and, before 1992, via blood transfusions. It is estimated that more than 100,000 people in Massachusetts have chronic hepatitis C, and some of them are at risk of cirrhosis, liver failure and liver cancer. A test to diagnose hepatitis C has been available for twenty years, but many people are unaware of their infection because they are not symptomatic and have not sought medical care.

Each year, from 7,000 to 9,000 people recently testing positive for hepatitis C are reported to the Massachusetts Department of Public Health. Most newly-diagnosed cases are in older adults; most of whom were

infected many years ago, but an increasing proportion of newly diagnosed cases is being reported in adolescents and young adults who were almost certainly infected recently. Treatment decisions are complex. Curative treatment is now available, although it can be prolonged, uncomfortable and expensive, and with an uncertain outcome. Untreated people with hepatitis C and those not responding to treatment face the prospect of lifelong chronic infection and the need for ongoing health care services

Figure 6.18 **Confirmed and Probable Chronic Hepatitis C Cases**



Source: MDPH Disease Surveillance System, 2000-2008.

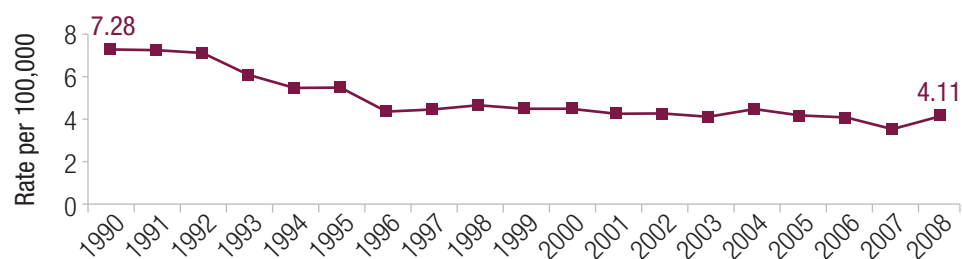
For chronic hepatitis C infection, the difference between a confirmed and probable case are the types of laboratory tests done. Both definitions indicate a strong likelihood of infection; as such, probable and confirmed cases of disease are included together.

## Tuberculosis

Tuberculosis (TB) disease can be found in any part of your body but it usually affects the lungs. The most common symptoms of TB disease are coughing, fever, loss of appetite, weight loss, weakness, night sweats and fatigue. While most persons with TB infection control the organism with their immune system and remain in a latent, asymptomatic state, some individuals develop an active form of the illness, causing the symptoms listed above and the risk for transmitting TB to others. In the 19<sup>th</sup> century, TB was the number one cause of death in Massachusetts. Fortunately, it can be treated successfully and cured, and now causes few deaths. However, TB is still with us and presents new and difficult challenges.

When latent infection is identified by skin test screening, treatment can prevent active TB, and thereby prevent the infected person from someday becoming infectious. More than 80% of the TB cases reported in 2008 were among people born in countries where infection in early life is common. These individuals come from more than 50 different countries, and have different cultures and languages. For this reason, and because skin testing is complicated to administer and read correctly, the challenge of TB prevention is substantial.

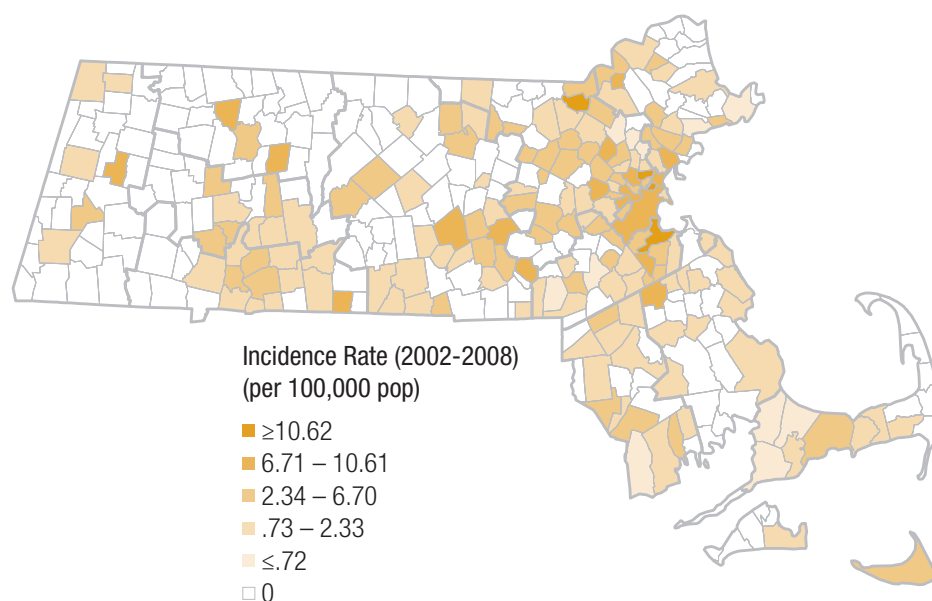
Figure 6.19 **Confirmed Active Tuberculosis Rates**



Source: MDPH Disease Surveillance System, 1990-2008.

TB is one of the most unequally distributed diseases, primarily affecting communities of color, non-US born individuals, and the poor. In 2008, 80% of TB cases occurred in members of the minority community. Eighty-two percent of people with TB were born outside the US. The oldest and poorest cities in the Commonwealth have the most TB.

Figure 6.20 **Average Annual Tuberculosis Incidence Rate**



Source: MDPH Disease Surveillance System, 2002-2008.

Despite vaccines, antimicrobials and all of the advances of modern medicine, infectious diseases still present a challenge to public health. The characteristics of modern life; travel, population growth and medical treatment that results in suppression of immunity creates new opportunities for infectious agents and new vulnerabilities to infection. Thus, the broad spectrum of historical and emerging infectious diseases requires continued vigilance, and attention to prevention and control. These prevention and control efforts must be multi-factorial and involve multidisciplinary approaches that include basic science, disease surveillance, education, health promotion,

clinical services, behavioral interventions and the use of vaccines and antimicrobials; approaches that have already proved effective. These are the essential components of public health infectious disease control.





**Donna Bright**

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**W**e now know that as long as humans are social beings and interact with a constantly changing environment, infectious diseases are here to stay. Vigilant prevention, early detection and effective treatment/interventions have been our best hope of minimizing disease and death. Yet new and persistent trends pose complex challenges to these public health response strategies. Emerging infections remain among the principal challenges to human survival. An increasingly mobile population provides opportunity for more widespread transmission. Increasing antibiotic resistance and growing numbers of immunocompromised patients threaten intervention efforts. Lastly, poverty and other social inequalities are stubborn determinants of health that challenge surveillance efforts and make prevention and treatment of infectious disease disparate and complicated. How do we use tried and true public health tools (epidemiology, prevention and multi-level intervention strategies) in new and better ways that keep pace with current and emerging trends?

Recent public health priorities speak to addressing health disparities found across relevant demographics: race, age, gender, sexual orientation and socioeconomic status. We recognize that key aspects of one's living and working circumstances and their lifestyles are influenced by these demographics and determine one's health. A fundamental premise of the social determinants approach is that there are many non-biological reasons for health inequities that can be targeted and addressed via social and economic policies. Many health policy experts believe that shifting our public health efforts toward addressing these structural factors (such as housing, discrimination, poverty) would go a long way in minimizing disease and disparities.

A 2008 report by the World Health Organization's Commission on the Social Determinants of Health – "Closing the gap in a generation: health equity through action on the social determinants of health" – calls for three principal areas of action:

- tackle the daily living conditions in which people are born, grow, live, work and age;
- tackle the structural drivers of those conditions at global, national

and local levels;

- carry out more research to measure the problem, evaluate action and increase awareness.

This is our next greatest challenge to preventing infectious disease: better integrating public health tools with community strategies that advocate social justice. Public health departments can make the case to policy makers for enacting social and economic policies that address the root of health inequities (such as poverty and discrimination) and for funding effective responses to social determinants of health. Departments can do this by generating clear evidence of the causal pathways (both proximal and distal) of social determinants of health *and* by strategic communication of that evidence. Similarly, a case can be made to the general public for organizing around a collective response: taking action that influences political priorities, health care and other organization policies or action that changes community norms.

For example, comprehensive sex education has been shown to be associated with reduced risk of sexually transmitted infections, yet Massachusetts does not require sex education in schools; and many parents are ill equipped to teach their children about not only abstinence as the best method for avoiding STIs and unintended pregnancy, but also about condoms and contraception to reduce the risk, and about the interpersonal and communication skills that help young people explore their own values, goals, and options.

The Massachusetts Department of Public Health could work across government and private agencies to aggregate the evidence and generate new evidence as needed to stimulate debate and make a more compelling case for changing school policies, particularly in districts with high prevalence of STIs among youth. In the meanwhile, more public health funding could be allocated for community based organizations to implement and test culturally specific sex education curricula among high risk youth, and educate parents – in an effort to change community norms, learn from practice and provide additional resources for informing school boards and state policy. Similar combinations of public health and community strategies can be employed to make the case for stably housing all residents or for on-demand access to drug treatment as critical health promotion and disease prevention tools. Perhaps most important, public health departments could help generate the political will for action.

# FIGURE NOTES

**Figure 6.1:** For 2000-2001:  $\geq 4$  DTP,  $\geq 3$  Polio,  $\geq 1$  Measles-containing vaccine,  $\geq 3$  Hib, and  $\geq 3$  HepB. 2002-2008:  $\geq 4$  DTaP/DTP,  $\geq 3$  Polio,  $\geq 1$  Measles-containing vaccine/MMR,  $\geq 3$  Hib,  $\geq 3$  HepB, and  $\geq 1$  Varicella.

**Figure 6.2-6.11:** Data as of August 2009 and are subject to change.

**Figure 6.7:** WNI was not reportable in Massachusetts until 2003.

**Figure 6.12-6.17:** Data as of January 2009 and are subject to change.

**Figure 6.14:** Data as of January 2009 for HIV infection diagnosed between 2005 and 2007. MSM = Male-to-Male Sex, Pres. HTSX = Presumed Heterosexual Sex, IDU = Injection Drug Use, HTSX = Heterosexual Sex.

**Figure 6.15-6.16:** Age-adjusted prevalence based on 2000 population estimates from the MDPH Center for Health Information, Statistics, Research and Evaluation. API = Asian/Pacific Islander.

**Figure 6.17:** For HIV infection diagnosed between 2005 and 2007.

**Figure 6.18:** Data as of August 2009 and are subject to change.

**Figure 6.19:** Rates per 100,000 population. Data as of August 2009 and are subject to change.

**Figure 6.20:** Rates per 100,000 population. Incidence cases as of August 2009 aggregated from years 2002-2008.



# Wellness and Chronic Disease



Prevention and treatment of chronic disease has emerged as a leading focus of public health efforts across the country. This report provides a glimpse of the alarming obesity epidemic and burden of chronic diseases and their combined impact on the well-being of residents of Massachusetts, as well as the health care system and economy of the Commonwealth.

This information links the rapidly rising rates of chronic diseases to associated risk factors such as poor nutrition, lack of physical activity, poor air quality, and exposure to tobacco. This report also reveals a gap in the state's ability to systematically monitor the impact of many of the chronic diseases on specific ethnic minority groups, including Asians and American Indians, and people with mental and physical disabilities.

A comprehensive examination of how current policies, systems, and environments in the home, community, workplace, school, and health care sites impact residents' health behavior and access to primary care and preventive services is an important step in the overall effort to improve the Health of Massachusetts.

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## The Social Spheres of Influence

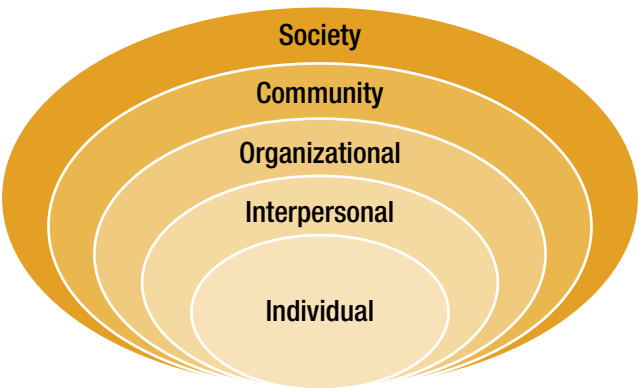
The Bureau of Community Health Access and Promotion – the Bureau at the Massachusetts Department of Public Health with primary

responsibility for the chronic diseases described in this section – has adopted the “Social-ecological Model.” This approach helps the Department to plan efforts directed at health promotion and the reduction of morbidity and mortality from preventable conditions (Figure 7.1).

This framework recognizes that our ability to make healthy choices is influenced by the policies, systems and environment that exist in the world around us.<sup>1</sup> Unfortunately, the social spheres that influence our lives often limit rather than support a person’s efforts to eat well, be physically active, and seek preventive care.

The result is a population suffering from multiple chronic ailments that generate staggering health care costs. This compromises the health of our residents, and puts the Commonwealth in dire fiscal straits. Whenever possible, we must consider making changes at the policy, systems, and environmental level to support individual’s healthy choices.

Figure 7.1 Ecological Model for Obesity Intervention



**More than half of  
Massachusetts adults –  
approximately three  
million people – are either  
overweight or obese.**

**Obesity**

Trends in nutrition and physical activity behaviors are at the center of the growing obesity epidemic. Currently, more than half of Massachusetts adults are either overweight or obese. Approximately 25% of high school youth and more than a third of children ages two to five years participating in the WIC program are either overweight, or at risk of becoming overweight.

People who are overweight or obese are more likely to have type 2 diabetes, heart disease, stroke, gall bladder disease, and musculoskeletal disorders. In addition, overweight and obesity are associated with some forms of cancer, and many other health problems that interfere with daily living and reduce the quality of life.

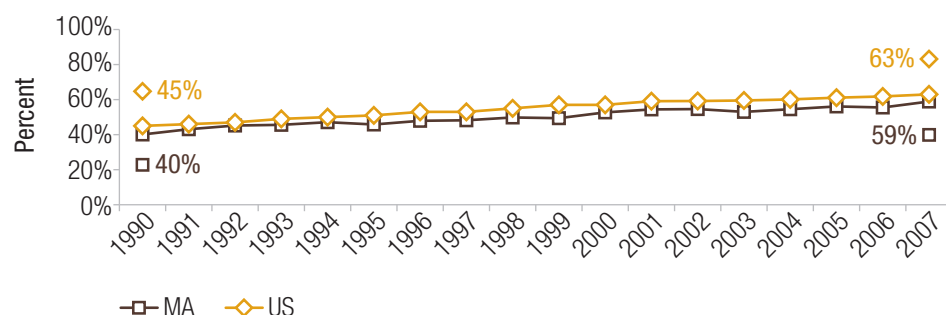


The cost of obesity is high, but quantifying the exact figures has been difficult. Obesity is not generally recognized as a disease, and is rarely listed as a primary diagnosis in hospital and medical records. Using current data sources, a conservative estimate of annual obesity-related medical costs for Massachusetts is \$1.8 billion in 2003 dollars.<sup>2</sup>

## Prevalence of Overweight and Obesity

Fifty-nine percent of Massachusetts adults are above a healthy weight. This is slightly below the national average of 63%. One in five adults is obese, and not only is obesity prevalence rising, but it exceeds the Healthy People 2010 target of 15% (Figure 7.4), and is fast approaching the 2007 national median (26%).

Figure 7.3 Overweight/Obesity Among Adults

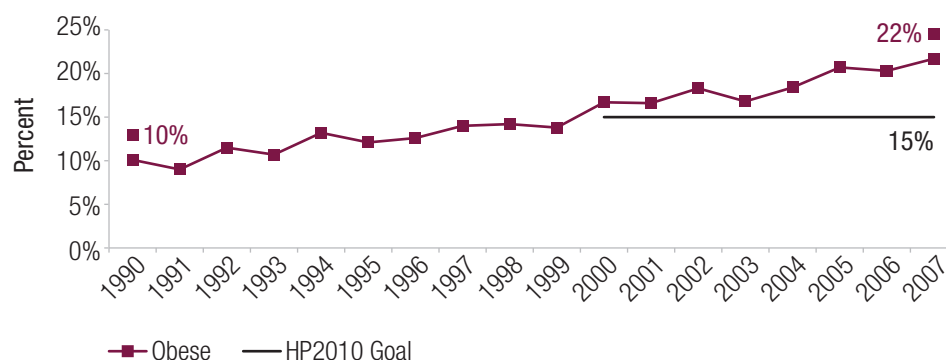


Source: MDPH BRFS 1990-2007 and US BRFS, 1990-2007.

## Health Status and Chronic Conditions

Compared with healthy weight adults, obese adults are more than three times as likely to have been diagnosed with diabetes or high blood pressure.<sup>3</sup>

Figure 7.4 Obesity Among Adults



Source: MDPH BRFS, 1990-2007; US Department of Health and Human Services Healthy People 2010 Database, 2000-2007.

Figure 7.2 Three of Five Adults in MA are Either Overweight or Obese



Body mass index (BMI) is used to screen for overweight and obesity. It approximates total body fat and is calculated by dividing weight in kilograms by height in meters squared. In adults, a body mass index between 18 and 25 is normal/healthy weight status, between 25 and 29.9 constitutes overweight, and 30 and higher is obese. BMI is not a perfect measure because it is calculated using weight and height only and does not take into account other objective measures such as waist circumference and muscle to fat ratio. Also, BMI is calculated and determined differently for children and adolescents.

**The cost of obesity is high.**

**A conservative estimate of obesity-related medical costs for Massachusetts is \$1.8 billion.**

Mobility limitations and other forms of disability also exacerbate the overweight-obesity problem. People with disability have a more than 60% chance of being obese (28% vs. 17%) compared with their healthy peers.<sup>4</sup>

Overweight and obesity are significantly associated with several clinical markers for morbidity. Women who were obese at age 40 lived 7.1 fewer years than their healthy weight peers. Men who were obese at age 40 lived 5.8 fewer years.<sup>5</sup>

## Children and Adolescents

Overweight is determined differently in children and adolescents than in adults. In children and adolescents, a BMI-for-age at or above the 95<sup>th</sup> percentile indicates obesity. Children with a BMI between the 85<sup>th</sup> and 95<sup>th</sup> percentiles for their age and gender are considered overweight. BMI classifications in children are both age- and gender-specific to account for changes in body fat that occur as they grow and mature.<sup>6</sup>

Healthy weight concerns are being seen at much earlier ages. More than one third of two to five year olds who participate in the Massachusetts WIC Program are either overweight (17%) or at risk of becoming overweight (17%).<sup>7</sup>

Similar patterns are observed among older children or adolescents. In 2007, 11% of high school students were obese and 15% were overweight (Figure 7.5). In the same year, 11% of middle school students were considered obese and 18% were overweight.<sup>8</sup> These rates far exceed national goals of 5%.

Overweight and obesity puts children and youth at risk of negative health and social behaviors. Overweight female middle and high school students are more likely to engage in unhealthy practices such as fasting, vomiting, or taking diet pills or laxatives to control their weight. High school students who think they are overweight are more likely to have experienced dating violence, considered suicide or attempted suicide.<sup>8</sup>

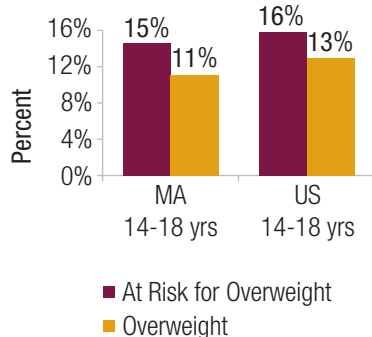
## Disparities in Overweight and Obesity

Disparities in obesity rates exist by race, education, income, gender, disability status, and geography. In Massachusetts, Hispanic adults are 50% more likely, and Black adults 60% more likely to be obese than their White counterparts.

Overall, obesity appears to be slightly more prevalent among men than women (Figure 7.6). However, this disparity becomes more apparent when examining racial groups. The prevalence estimates for Black women, 37%, and Hispanic women, 31%, both exceed the corresponding state estimate for all women 20%.

Adults with less than a high school diploma have a 210% increased likelihood of being obese compared with college graduates.<sup>9</sup> Adults who earn

Figure 7.5 **Obese or Overweight Among Adolescents**



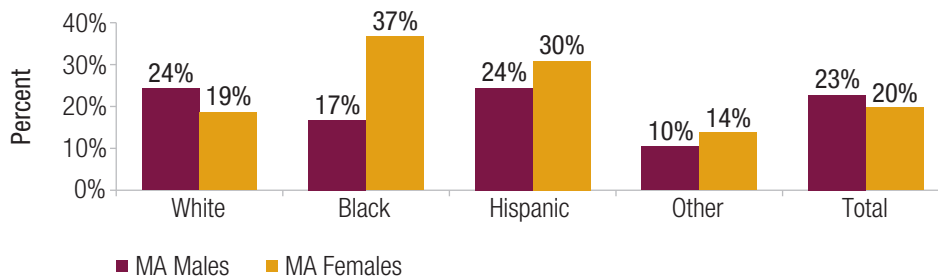
Source: Massachusetts Department of Elementary and Secondary Education Youth Risk Behavior Survey; CDC Youth Risk Behavior Survey, 2007.

\$50,000 or less annually are more likely to be obese than those earning \$50,000 or more.

Disparities in overweight also exist among adolescents according to gender and racial groups. The 2007 Massachusetts Youth Risk Behavior Survey (YRBS) found that male high school students were more than twice as likely to be overweight than female students (14.8% vs. 7.1%, respectively). In addition, Black, Hispanic, and students of multiple ethnicities were more likely to be overweight than their White peers: 22% of Black students, 15% of Hispanic students, 11% of students of multiple ethnicity, and 10% of Asian students were overweight, compared with 9% of white students (Figure 7.7).

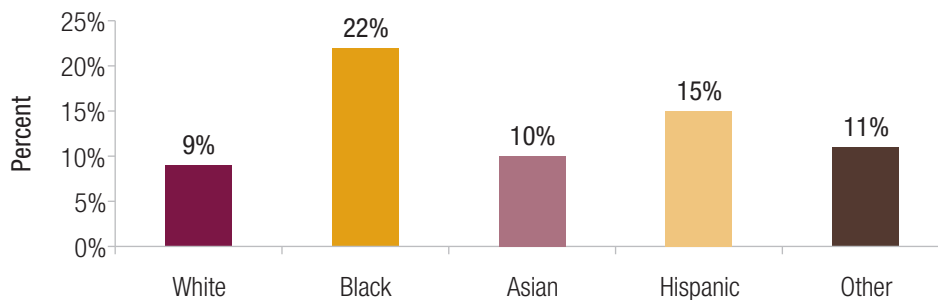
Sedentary behavior such as TV watching is more prevalent among Black and Hispanic students than among White students. Almost half (49%) of the Hispanic students and 46% of Black students in the Commonwealth watch three or more hours of television on an average school day compared with 27% of their White peers.

Figure 7.6 **Obesity Among Adults**



Source: MDPH BRFSS, 2007.

Figure 7.7 **Overweight Among High School Students**



Source: Massachusetts Department of Elementary and Secondary Education Youth Risk Behavior Survey, 2007.

## Modifiable Risk Factors for Obesity and Overweight

A balanced diet low in saturated fats and added sugars, but rich in fiber from fruits, vegetables, and whole grains protects and promotes good health and may help control overweight and obesity.<sup>10,11,12</sup> Also, regular physical activity reduces a person's risk for obesity and overweight, and adds many other health benefits, including reduced risk of chronic disease morbidity, fall-related injuries, and all-cause mortality.<sup>13</sup>



### Mass in Motion

*Mass in Motion* is a multi-faceted approach to health promotion launched in January 2009 to promote wellness and to prevent obesity in Massachusetts. With a particular focus on the importance of healthy eating and increasing physical activity, *Mass In Motion* includes:

- » Interactive website and public education campaign ([www.mass.gov/MassInMotion](http://www.mass.gov/MassInMotion)).
- » New requirements for large chain restaurants to post calorie information for the food they serve.
- » Healthy food requirements for state agencies for all food purchased and served.
- » Funding for cities and towns to develop policy and environmental change initiatives.
- » Workplace initiative to improve the health of employees and support healthier worksites.

## Eating Patterns

The US Department of Agriculture (USDA) recommends eating at least two servings of fruit and three servings of vegetables daily (commonly referred to as five or more servings of fruits and vegetables).<sup>14</sup> However BRFSS data indicate that in 1996 only 26% of Massachusetts residents met that target. By 2007, that figure was relatively unchanged at 27.5%.<sup>15</sup>

The picture is slightly worse for children and teens: only 15% of high school students reported eating five or more servings of fruits and vegetables per day. Only 15% of middle school boys and 13% of girls reported consuming three or more servings of vegetables the day before the survey.

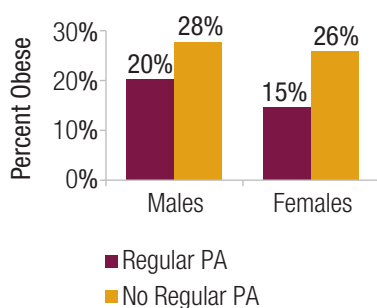
## Activity Patterns

Despite the clear benefits, many Massachusetts adults and adolescents fall short of the Surgeon General's physical activity recommendations which encourage adults to get 30 minutes or more of moderate-intensity physical activity most days of the week.<sup>16</sup> About half of Massachusetts adults report regular moderate physical activity (both leisure and non-leisure).

Women who get no regular physical activity have almost twice the likelihood of being obese compared with those who do (25.8% vs. 14.6%) (Figure 7.8).

The Dietary Guidelines for Americans recommend that children and adolescents participate in at least 60 minutes of moderate intensity physical activity most days of the week, preferably daily.<sup>17</sup> However, among Massachusetts high school students, only 41% report engaging in moderate to vigorous physical activity on five or more days per week for at least 60 minutes. This estimate is higher than the 2007 national data that shows that only about 35% of high schools students nationally meet this recommendation. Nevertheless, six out of ten Massachusetts high school students do not meet the recommended guidelines for physical activity.<sup>18</sup>

Figure 7.8 **Regular Physical Activity and Obesity**



Source: MDPH BRFSS, 2007.

The number of Massachusetts high school students attending physical education classes at least once a week declined from 80% in 1993 to 61% in 2007. In 1996, the state mandate stipulating the amount of school time earmarked for physical education was eliminated.

## Television and Video Viewing Patterns

Television viewing, a major sedentary behavior in the United States, contributes to overweight and obesity in adolescents and adults as well as adult-onset type 2 diabetes.<sup>19,20,21</sup> The YRBS reports that Massachusetts high school students who watch three or more hours of television per day are more likely than their peers to be overweight (14% vs. 8%). The percent of Massachusetts high school students who watch three or more hours of

television a day decreased from 35% in 1999 to 28% in 2007. This encouraging estimate is also lower than the 2007 national estimate of 35.4%.<sup>22</sup>

Similar sedentary behaviors are observed among middle school students: according to the 2007 YHS data 35.9% of boys and 31.1% of girls watch three or more hours of TV on an average school day. This does not include other screen time such as time spent on computers, on-line and video games.

Differences exist in TV viewing habits among racial groups. Almost half (49%) of the Hispanic students and 46% of Black students in the Commonwealth watch three or more hours of television on an average school day followed by 35% of Asian students, 35% of 'Other' or 'Multiple ethnicity' students, and only 27% of White students.

More Massachusetts students also reported spending time on other similar sedentary behavior than their national peers. Thirty percent of Massachusetts high school students reported playing video or computer games or using the computer for something other than school work for three or more hours on an average school day. This compares with 25% of US high school students.

The data presented link how poor nutrition, lack of regular moderate physical activity and sedentary behavior among children contribute to the growing obesity epidemic and associated chronic diseases. A comprehensive examination and understanding of these factors and their impact on overweight/obesity can facilitate a concerted and coordinated response to this growing public health epidemic. A concerted effort at all levels of the Commonwealth can help create environments that support individuals in making healthy choices and help curb the growing obesity epidemic.

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## Asthma

Asthma is a common and growing public health problem that impacts the lives of many individuals in the United States and Massachusetts. Nationally, the prevalence of asthma has been increasing since 1980 across all age, gender, and racial groups. In Massachusetts, the prevalence of asthma is one of the highest in the country.<sup>23</sup>

In most cases, the exact cause of asthma is unknown. While there is no cure for asthma, asthma can be controlled, and people with asthma are able to sleep through the night, go to work and school, and live normal active lives. However, in Massachusetts, a startlingly small portion of people with asthma have good control of their condition – approximately one in four adults and one in three children (Figure 7.9).

The costs associated with asthma are substantial. In 2007 in Massachusetts, the total hospital charges associated with asthma exceeded \$136 million. In the US, the total direct and indirect costs were \$19.7 billion.<sup>24</sup>

Asthma is a chronic inflammatory disease of the airways. The airways become constricted due to swelling and excessive mucous production in response to exposure to environmental triggers. Symptoms of asthma are wheezing, coughing, chest tightness, and trouble breathing.



Figure 7.9a **Asthma Control Among Adults**

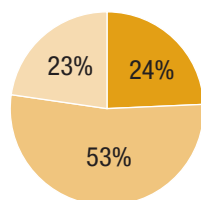
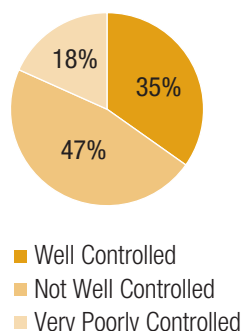


Figure 7.9b **Asthma Control Among Children**



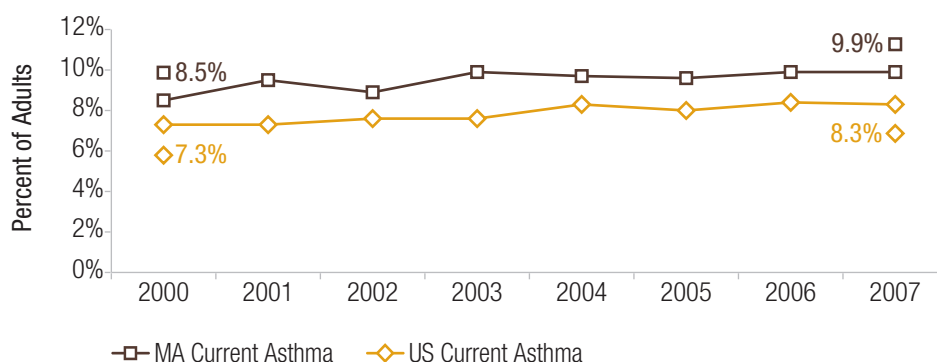
Source: MDPH BRFSS Adult and Child Asthma Call-back Survey, 2006-2007.

The health and economic burden of asthma underscore the need to improve diagnosis and management of asthma, reduce exposure to known environmental triggers, and promote research on the causes of asthma are necessary.<sup>29</sup>

## Prevalence of Asthma

In 2007, the prevalence of current asthma among Massachusetts adults was 9.9%, a 16.5% increase from 2000. Among children, the prevalence of current asthma in 2007 was 10.5%.

Figure 7.10 **Trends in Prevalence of Current Asthma Among Adults**



Source: MDPH BRFSS, 2000-2007.

\*The prevalence of current asthma was statistically higher in MA than the US ( $p \leq 0.05$ ) for every year examined.

**When asthma is well controlled, people can sleep through the night, go to work and school, and live normal active lives. However, a startling small portion of people with asthma have good control of their condition – only one in four adults and one in three children.**

The characteristics of adults and children with asthma varied by demographics and health risk indicators. According to the BRFSS from 2005 through 2007, while there were no differences across racial and ethnic subgroups, current asthma was higher among adult females, male children, adults and children in households with low educational attainment, adults and children in households with incomes less than \$75,000, adult smokers, and adults with disabilities.

## Hospital Visits for Asthma

Asthma can be controlled through careful disease management – such as self-management education and use of asthma action plans – and avoidance of environmental triggers. Severe asthma outcomes such as hospitalizations can be prevented. The asthma hospitalization and emergency department rates in Massachusetts are higher than the HP2010 target rates (Figure 7.11).

In Massachusetts, children ages zero to four years, adults ages 65 and older, and Black and Hispanic residents have much higher rates of hospitalization due to asthma compared to the overall state rate. Asthma hospitalization rates among Black and Hispanic residents were approximately three times higher than the rate for White residents (Figure 7.12).



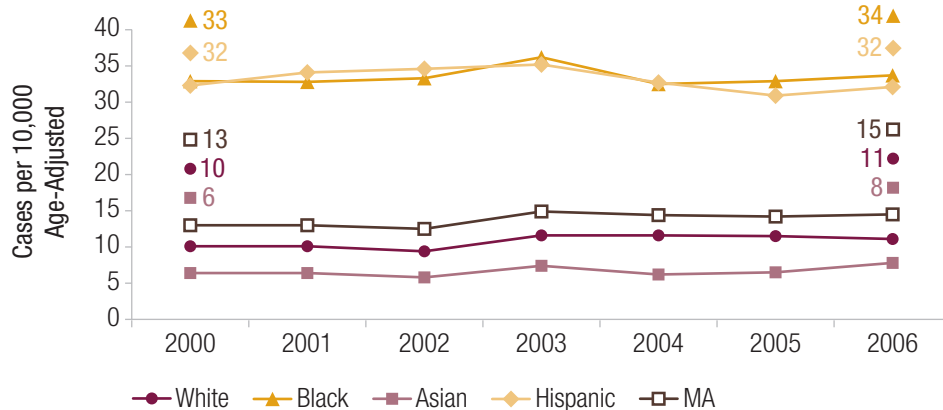
Figure 7.11 Asthma Hospitalization and ED Rates by Age

Objective	Age Group	MA	HP2010
Reduce hospitalizations for asthma (rate per 10,000)	0-4 Years	37*	25
	5-64 Years	11*	8
	65+ Years	26*	11
Reduce emergency department visits for asthma (rate per 10,000)	0-4 Years	123*	80
	5-64 Years	57*	50
	65+ Years	19*	15

Source: Massachusetts Division of Health Care Finance and Policy, Inpatient Hospitalization and Emergency Department Discharge Databases, FY2005-2007; US Department of Health and Human Services Healthy People 2010 Database, 2000-2007.

\*Statistically different from the HP2010 target ( $p \leq 0.05$ ).

Figure 7.12 Asthma Hospitalization Rate by Race and Ethnicity



Source: Massachusetts Division of Health Care Finance and Policy, Inpatient Hospital Discharge Database, FY2000-2006.

\*All racial/ethnic subgroups were statistically different from the Massachusetts rate ( $p \leq 0.05$ ) for every year examined.

The Southeast region had a rate of asthma hospitalization that was 15% higher than the overall Massachusetts rate. For the Boston region, the rate was 50% higher than the overall state rate.

### Environmental Factors that Cause and/or Exacerbate Asthma

There are approximately 335 substances known to cause or suspected of causing or exacerbating asthma symptoms.<sup>25</sup> These include certain chemicals, allergens (mold, pet dander, dust mites, mice, and cockroaches), tobacco smoke and viral respiratory infections.

The primary outdoor air pollutants linked to asthma are ground level ozone, sulfur dioxide, particulate matter and nitrogen oxides. Children are particularly vulnerable to environmental factors as their bodies take in proportionately greater amounts of these substances than adults. Reducing

**Black and Hispanic residents suffer disproportionately from poor asthma outcomes compared to their White counterparts.**

Figure 7.13 Asthma Hospitalization Rate by EOHHS Region

EOHHS Region	Cases per 10,000
Western	13.2*
Central	13.9
Northeast	14.1
MetroWest	9.9*
Southeast	16.5*
Boston	21.5*
MA Total	14.4

Source: Massachusetts Health Care Finance and Policy, Inpatient Hospital Discharge Database, FY2005-2007.

\*Statistically different than the Massachusetts rate ( $p \leq 0.05$ ).

**Reducing harmful exposures in the home, school, work and neighborhood environment is necessary to control and in some cases, prevent asthma.**

harmful exposures in the places where people with asthma spend most of their time – home, school, work and neighborhoods – is necessary to control and in some cases, prevent asthma.

Housing can seriously influence health, especially for people with asthma. According to the 2007 American Housing Survey, the percentage of New England homes with severe physical problems is approximately twice that of the US.<sup>26</sup> These problems include signs of mice, leaks, incomplete plumbing and exterior problems with the roof, siding and foundation.

Figure 7.14 Environmental Triggers in the Homes of Those with Current Asthma

Trigger	Adults %	Children %
Carpeting or rugs in bedroom	58.5	56.3
Pets in home	59.3	49.6
Pets in bedroom	48.8	26.6
Use gas for cooking	41.8	51.5
Use wood burning fireplace or stove	24.0	27.2
Use unvented gas logs, fireplace, or stove	*	*
Smoking in the home (past week)	18.2	*
Mold in the home (past month)	16.4	*
Mice or rats in the home (past month)	7.9	11.0
Cockroaches in the home (past month)	*	*

More data on indoor and outdoor environmental factors can be found in Chapter 8 - Environmental Health.

**Inside the Home**

Mold is present in almost 2 out of 10 homes of adults with asthma. Persistent moisture problems can lead to structural problems and may exacerbate pest problems. Policies are needed to improve the conditions in affordable housing and encourage homeowners to repair damages. Almost 2 out of 10 homes of adults with asthma had someone smoking inside the home in the past week. Smoking does not affect just the smoker, but also family members and neighbors. Smoke-free housing policies can effectively limit exposure.

For more information on work-related asthma, see Chapter 9: Occupational Health.

Source: MDPH Adult and Child Asthma Call-back Survey, 2006-2007.  
\*Percentages not shown if the unweighted sample size for the denominator was <50 or if the relative standard error was ≥ 30%.

For adults, exposures in the work environment are important contributing factors that can cause asthma or make asthma symptoms worse. According to the Asthma Call-back Survey, 40% of adults with asthma reported that their current or previous workplace environment caused or aggravated their asthma, and 5% reported changing or quitting their job because of their work-related asthma.<sup>27</sup>

The American College of Chest Physicians recommends that doctors discuss work exposures with all adults with new onset or worsening asthma symptoms. All health care providers practicing in Massachusetts are required to report work-related asthma to the MDPH.<sup>28</sup> By reporting cases to MDPH, health care providers can play an important role in primary prevention of work-related asthma.

Creating healthy environments in homes, schools, workplaces, and neighborhoods, minimizing exposure to triggers and implementing better asthma management practices, such as self-management education and asthma action plans, are essential to prevent and control asthma in Massachusetts.<sup>29</sup>

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## Diabetes

Diabetes is a disease where sugar accumulates in the blood (called “blood glucose”) at much higher levels than normal. Poorly controlled blood glucose can lead to several serious complications including blindness, kidney failure, stroke, amputation of the lower leg, and heart attack.

Diabetes is classified as either type 1 or type 2. In type 1 diabetes, the body cannot produce insulin, a hormone used to convert sugar, starches, and other food into the energy needed for everyday life. In type 2 diabetes, the body can produce insulin, but does not use it efficiently.

Nearly 95% of people with diabetes have type 2 diabetes, a condition associated with overweight and obesity.<sup>30</sup> This section will focus on type 2 diabetes.

### Risk Factors

Pre-diabetes and gestational diabetes are two conditions that indicate a person has an increased risk for developing type 2 diabetes. Prevention efforts should focus on people with these conditions.

A person with pre-diabetes has higher blood glucose levels than normal, but not high enough for a diagnosis of diabetes. Gestational diabetes occurs in women during a pregnancy where they experience glucose intolerance. It can cause complications to both the mother and her child.<sup>31</sup> The child also has an increased risk for developing type 2 diabetes later in life.<sup>32,33,34,35</sup>

Other individuals at increased risk for type 2 diabetes include those with a family history of diabetes (having a parent, brother or sister with diabetes), older individuals, racial and ethnic minorities (African-American, American Indian, Asian-American, Pacific Islander, or Hispanic-American/Latino heritage), and those with high blood pressure or high cholesterol.

### Impact and Scope of Diabetes

More than 300,000 people in Massachusetts have diagnosed diabetes. Based on estimates from the Centers for Disease Control and Prevention, there may be an additional 100,000 undiagnosed individuals in the Commonwealth.<sup>36</sup>

In 2008, 7.2% of the Massachusetts adult population reported that they have been diagnosed with diabetes. This represents nearly a 75% increase since 1994. Given the strong association between overweight/obesity and type 2 diabetes, the major increase of type 2 diabetes may be attributed to the overweight/obesity increase during the same period.<sup>36</sup>

In 2007, 5.4% of the adult population in Massachusetts reported that they had been diagnosed with pre-diabetes.<sup>37</sup> The Centers for Disease Control

**Nearly 95% of people with diabetes have type 2 diabetes, a condition associated with overweight and obesity.**

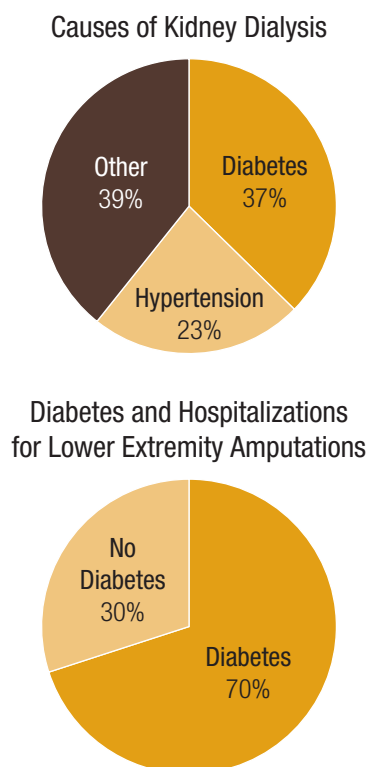
For more information on gestational diabetes, see Chapter 5: Natality and Early Childhood.

**In 2008, 7.2% of the Massachusetts adult population reported that they have been diagnosed with diabetes. This represents nearly a 75% increase since 1994.**

## The American Diabetes

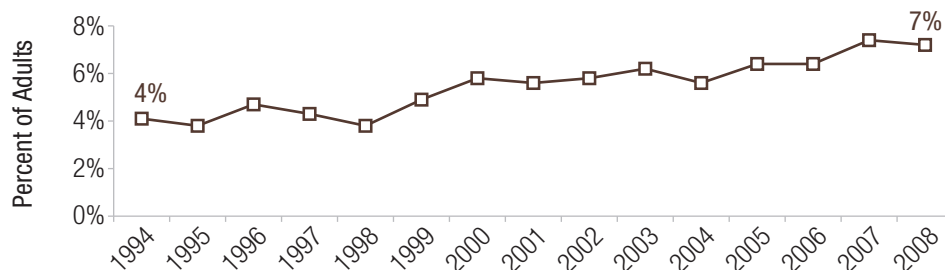
**Association estimates the nation's annual price tag for diabetes is \$174 billion.**

Figure 7.16 Major Complications of Diabetes



Source: (Top) New England End-Stage Renal Disease Network, 2007; (Bottom) Massachusetts Division of Health Care Finance & Policy, Uniform Hospital Discharge Data Set, 2007.

Figure 7.15 Trends in Prevalence of Diabetes Among Adults

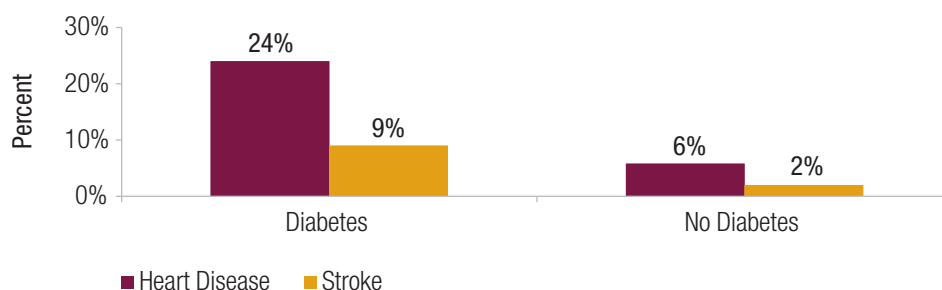


Source: MDPH BRFSS, 1994-2008.

and Prevention has estimated that the prevalence of pre-diabetes may be 25% of the adult US population but that most people are unaware of their condition. Clinical trial results have shown a 58% reduction of new cases of diabetes through lifestyle intervention among people with pre-diabetes.<sup>38,39,40</sup>

Diabetes is one of the most costly chronic diseases in the United States. It absorbs 25% of the Medicare budget<sup>41</sup> and the American Diabetes Association estimates the nation's annual price tag for diabetes based on 2007 expenses is \$174 billion.<sup>42</sup> However, much of the health care costs associated with diabetes care are avoidable if providers can meet the standards of care for diabetes and patients can achieve good self-management. According to the Massachusetts Division of Health Care Finance and Policy, diabetes ranks fifth among causes of preventable hospitalizations for adults aged 18 and older.<sup>43</sup> Even the most serious complications caused by diabetes can be prevented.

Figure 7.17 Prevalence of Heart Disease and Stroke by Diabetes, Adults 45+



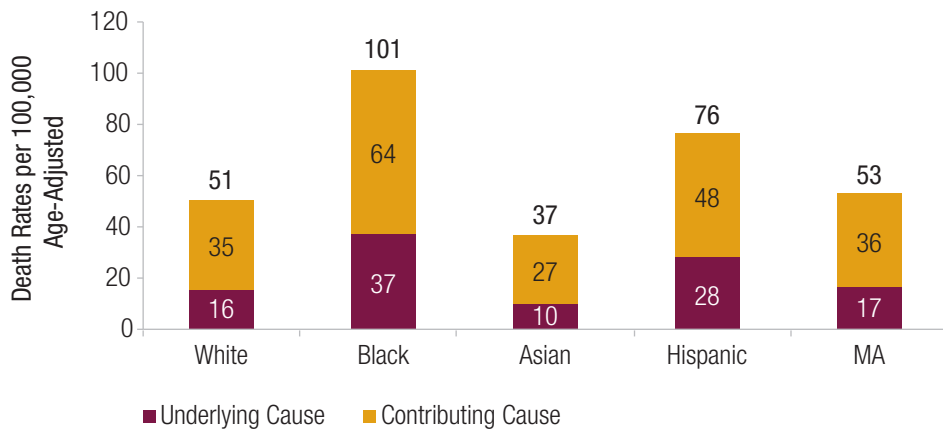
Source: MDPH BRFSS, 2008.

The clinical and economic consequences of diabetes do not impact everyone equally, and diabetes and its consequences can vary greatly depending on several variables. Gender, race/ethnicity, disability status, primary language, literacy level, where a person lives, income, and education can influence how well a person can maintain a healthy lifestyle. These same factors may also affect how well a community or a health care system can provide services to a person with diabetes.

Men have diabetes at higher rates than women (7.9% vs. 5.9%). Black and Hispanic populations have nearly twice the rate of diabetes as White populations. Those with less income and fewer years of education have significantly higher rates of diabetes. Higher rates of diabetes are found in certain communities, including Lawrence (12.8%), Springfield (12.3%) and Fall River (10.8%), compared to the state as a whole (6.8%).

In 2007, diabetes was the ninth leading cause of death in Massachusetts. Diabetes was also associated with many more deaths as a contributing condition. Compared with other race/ethnic populations, Black and Hispanic residents have much higher death rates from diabetes as the underlying and contributing condition.

Figure 7.18 Diabetes Death Rates



Source: MDPH Death File, 2007.

Screening, Quality Improvement, Community

The best way to improve detection of undiagnosed diabetes and pre-diabetes is through screening of high-risk populations. Every resident aged 45 and older should be screened regularly for diabetes. Those under the age of 45 should be screened if they are overweight and have at least one other risk factor for diabetes. Anyone found to have pre-diabetes at screening should receive intervention to prevent diabetes and then be regularly screened for diabetes.

For those with diabetes, receiving preventive care and achieving good self-management of their blood glucose level are vital to avoiding complications that generate associated costs. Preventive care includes receiving annual foot exams that test for numbness, annual dilated eye exams, flu and pneumonia vaccinations, tests for kidney disease, regular HgA1c tests, and support with quitting smoking.

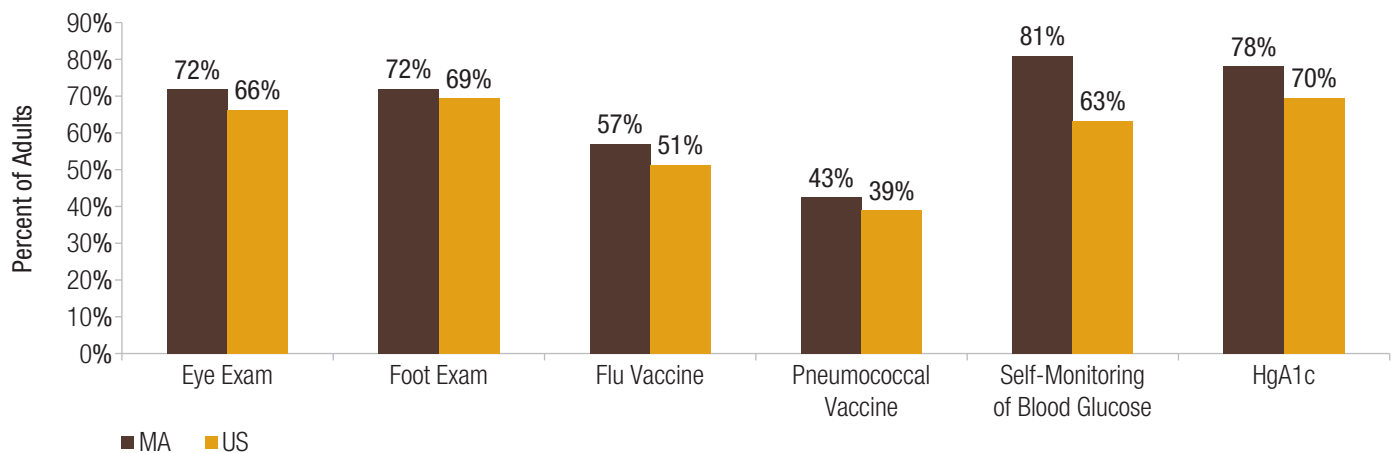
Self-management involves regular monitoring of blood glucose, good nutrition, regular physical activity and achieving a healthy weight. All

Reducing the Burden of Diabetes

To reduce the impact of diabetes, major goals should include improved diagnosing of diabetes and pre-diabetes, interventions for those at high risk (pre-diabetes, history of gestational diabetes) and preventing complications (meeting standards of care, taking prescribed medications, control of blood glucose, tobacco cessation and greater access to and participation in self-management training).

people with diabetes should receive nutrition counseling, support from their clinical diabetes educator, counseling in managing their diabetes, and chronic disease self-management training. A person with diabetes who also has other chronic diseases such as high blood pressure, high cholesterol or cardiovascular disease must also manage these conditions in order to avoid complications from diabetes.

Figure 7.19 Diabetes Preventive Care



Sources: MDPH BRFSS, 2008; US BRFSS, 2006.

### Key Responses to the Increasing Burden of Diabetes

Massachusetts Department of Public Health Diabetes Pilot Projects:

- » Implementing interventions for high-risk people and promoting system changes at the work site.
- » Establishing consistent standards of care across all MA insurance carriers for adult diabetes care and for gestational diabetes.
- » Promoting flu and pneumonia vaccinations for people with diabetes.

It is important to receive all types of preventive care for diabetes. Unfortunately, fewer than one fifth of persons with diabetes receive all of their preventive care and only half have reported taking a self-management course for their diabetes.<sup>44</sup>

### Heart Disease and Stroke

Diseases of the heart and blood vessels, together called cardiovascular disease or CVD, kill more people in Massachusetts and the nation than any other disease. In 2007, CVD caused one of every three deaths in Massachusetts.<sup>45</sup>

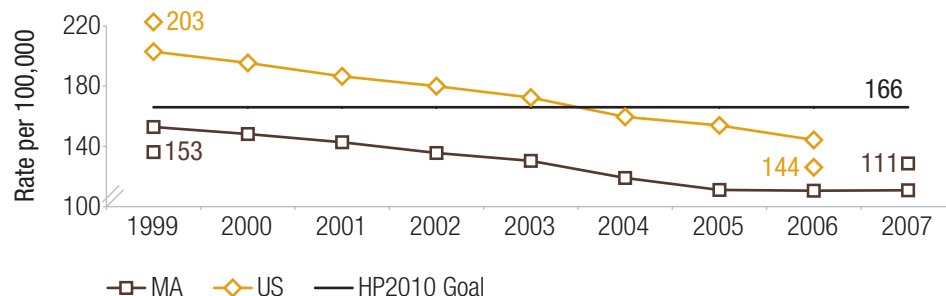
The most familiar and deadly form of CVD is coronary heart disease (CHD), the disorder that leads to heart attacks (Figure 7.20). CHD occurs when the arteries that supply nutrient-rich blood to the heart narrow and harden due to the buildup of plaque, a condition called atherosclerosis. The same mechanism is responsible for the occurrence of stroke, where plaque accumulates in arteries and blocks the supply of blood to the brain.<sup>46</sup>

For the past decade, the death rates from heart disease and stroke in Massachusetts have declined, and far surpassed the national HP2010 goals and the national average (Figures 7.21 and 7.22).<sup>46,47,48</sup> Despite this accomplishment, risk factors directly related to these diseases, including high



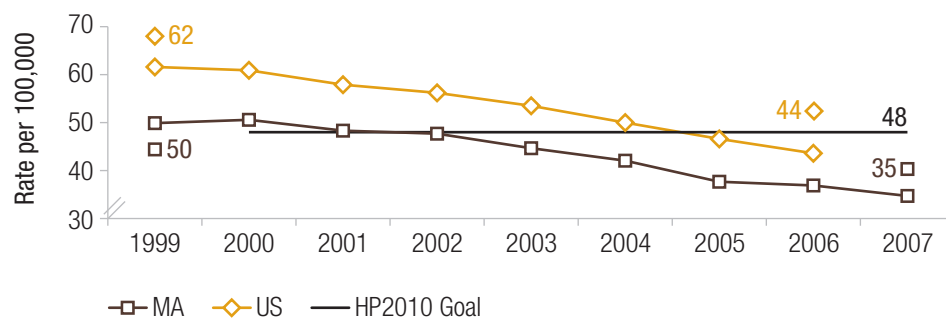
blood pressure, high cholesterol, diabetes, tobacco use, and obesity are on the rise and highly prevalent among Massachusetts residents, especially among minority populations.

Figure 7.21 **Coronary Heart Disease Death Rates**



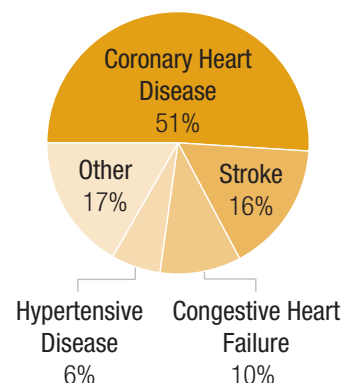
Source: MDPH Death File, 1999-2007; CDC Wonder Compressed Mortality (Web), 1999-2006.

Figure 7.22 **Stroke Death Rates**



Source: MDPH Death File, 1999-2007; CDC Wonder Compressed Mortality (Web), 1999-2006.

Figure 7.20 **Cardiovascular Disease Deaths**



Source: MDPH Death File, 2007.

Note: Other includes Rheumatic, Pulmonary, Atherosclerosis and other circulatory diseases.

Not only are cardiovascular diseases a leading cause of death, they are also a major cause of permanent disability. Nationally, they are the most costly group of diseases, with an estimated \$475 billion in both direct and indirect costs in 2009.<sup>49</sup>

Massachusetts-specific data on the true cost of disease are not readily available. However, one indicator of the economic burden of heart disease and stroke on the Commonwealth is inpatient hospitalization charges. Although the prevalence of cardiovascular diseases have declined in recent years, total inpatient hospital charges have increased annually. In 2007, charges for CVD approached \$3.5 billion, representing nearly one-third of the total hospital charges for that year (Figure 7.23).<sup>50</sup>

Cardiovascular disease can be prevented in most cases by controlling blood pressure, cholesterol and diabetes, avoiding tobacco, eating a healthy diet, and exercising regularly. Prompt recognition and treatment for heart attack or stroke can have a significant positive impact on outcomes and resulting quality of life.<sup>51</sup>

Figure 7.24 Signs and Symptoms of Stroke



Source: MDPH, Heart Disease and Stroke Prevention and Control Program.

Free educational materials are available in English, Spanish, Portuguese, and Khmer at [www.maclearringhouse.org](http://www.maclearringhouse.org).

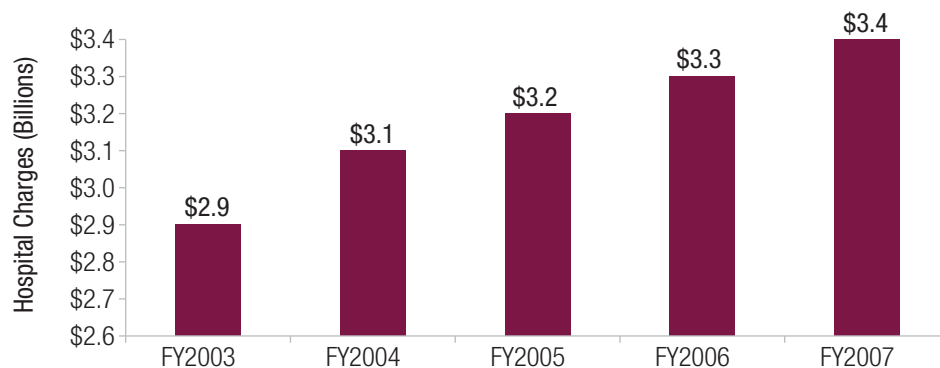
Figure 7.25 High Blood Pressure and High Cholesterol Among Adults 35+

	1997	2007
High Blood Pressure	26%	33%*
High Cholesterol	29%	40%*

Source: MDPH BRFSS, 1997-2007.

\*Trend is statistically significant ( $p \leq 0.05$ ).

Figure 7.23 Total Charges for Inpatient Hospitalizations for CVD



Source: Massachusetts Division of Health Care Finance and Policy Hospitalization Department Discharge Databases, FY2007.

In 2007, only 15% of adults in Massachusetts could recognize all signs of heart attack, while only 23% could recognize all signs of stroke.<sup>37</sup> Because only one in four people recognize all signs of a stroke, the Heart Disease and Stroke Prevention and Control Program developed a comprehensive public education campaign on the signs and symptoms of stroke and the need to call 9-1-1 for assistance (Figure 7.24).

## Prevalence of Heart Disease and Stroke

In 2008, 7% of adults age 35 or older, or about 250,000 people, reported having coronary heart disease. Additionally, 5% of the same adult age group reported having had a heart attack and 3% reported having had a stroke.<sup>36</sup>

Some groups in the Commonwealth have higher rates of heart disease and stroke than others. These include people ages 75 or older, men, persons with disabilities, and Blacks. Those with the lowest education levels and lowest income are also disproportionately affected.

## Risk Factors for Heart Disease and Stroke

Significant increases in the prevalence of two cardiovascular risk factors - high blood pressure and high cholesterol - are becoming an increasing concern (Figure 7.25).<sup>52</sup> Because of the lack of symptoms, it is important to have both checked regularly. When present, these risk factors can be prevented or controlled through medication and lifestyle changes.

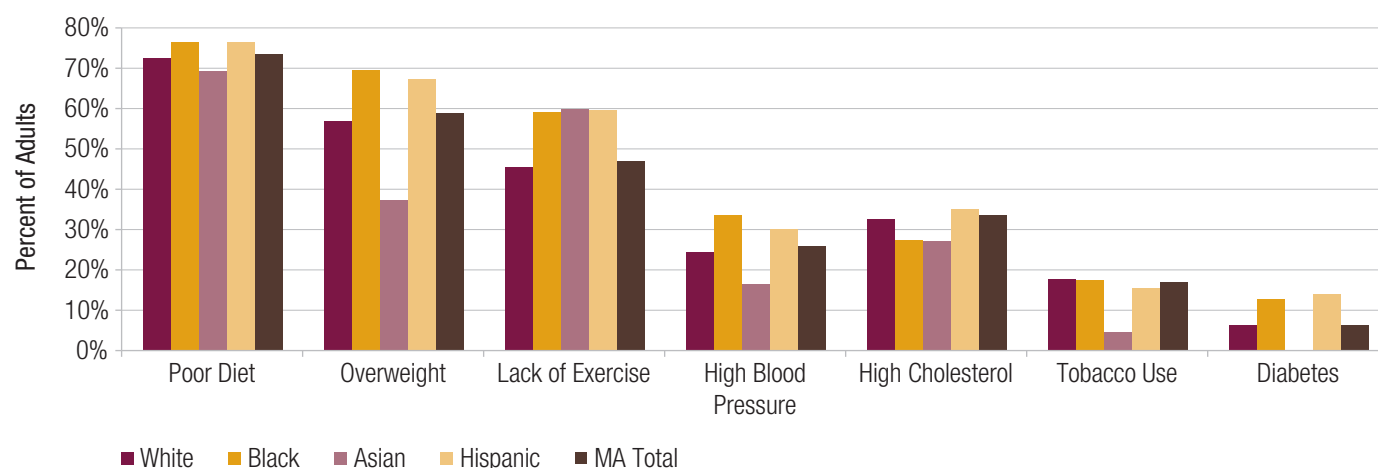
Virtually all population groups 18 and older in Massachusetts have rates of high blood pressure above the HP2010 target of 16%. The rate for Blacks is 34%; for Whites, 24%; and for Hispanics, 30%. Older individuals are at greatest risk of developing high blood pressure. Of residents aged 75 and older, 60% have high blood pressure compared with 26% of those aged 45-54.<sup>37</sup>

In 2007, 33% of Massachusetts residents, aged 18 years and older, had high cholesterol. Those between the ages of 65 and 74 years reported the highest percentage with high cholesterol. A higher proportion of males reported high cholesterol levels compared with females. Hispanics reported the highest proportion of all racial/ethnic groups.<sup>37</sup>

Among racial/ethnic groups, Black individuals and Hispanics reported the highest prevalence of a poor diet, being overweight or obese, having high blood pressure, and having diabetes. These groups were also among the highest to report not engaging in regular physical activity. Only Asian individuals are less active; However, Asian individuals reported the lowest prevalence of having a poor diet, being overweight or obese, high blood pressure, high cholesterol, and tobacco use (Figure 7.26).

**Persons with disabilities, those with less than a high school education, and residents earning less than \$25,000 have the highest rates of cardiovascular disease.**

Figure 7.26 CVD Risk Factors



Source: MDPH BRFSS, 2007.

There is often a clustering of these modifiable risk factors and it is important to consider their cumulative effects on developing CVD. Among those who have never had either a stroke or heart attack, only 8% have five or more risk factors. Among those who have ever had either a heart attack or stroke, 43% had five or more risk factors.<sup>37</sup>

### Associated Diagnoses with Heart Disease and Stroke

The harmful effects of heart disease and stroke profoundly manifest themselves in patients diagnosed with diabetes. In 2007, individuals in Massachusetts with diabetes had more than twice the prevalence of heart disease, heart attack and stroke than those without diabetes.<sup>37</sup> Complications from CVD not only occur at earlier ages but also cause premature death for those with diabetes. People with diabetes have a nearly four-fold risk of having a stroke and are at double the risk of having a subsequent stroke.<sup>53</sup>

While Massachusetts has made great strides in reducing overall morbidity and mortality due to heart disease and stroke, there is still opportunity for improvement, especially in terms of primary risk factor prevention. Together, diseases of the heart and blood vessels still cause substantial amounts of preventable death, disability, and financial burden for Massachusetts residents.

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## Cancer

Cancer is a group of diseases in which abnormal cells divide uncontrollably and can invade other tissues.<sup>54</sup> Although not all cancers can be prevented, risk factors for some cancers can be minimized through behavioral changes, vaccines, or antibiotics.

Regular screening for some cancers can help to detect them early, and the removal of precancerous growths (such as colon polyps or moles) can prevent some cancers from spreading to other parts of the body. It is estimated that most cancer deaths can be prevented by regular screening and early detection.<sup>55</sup> Fecal occult blood tests (FOBT), sigmoidoscopy, and colonoscopy are some of the tests and procedures that can detect colorectal cancer in its early stages.<sup>56</sup> Breast cancers can be detected earlier by mammography and clinical breast exams, and prostate cancers can be detected using prostate-specific antigen (PSA) and digital rectal exams (DRE).

Cancer is the leading cause of death in Massachusetts, followed by heart disease, stroke, and chronic lower respiratory disease.<sup>57</sup> Lung, prostate, colorectal, and pancreatic cancers are the leading causes of cancer deaths among males, while lung, breast, colorectal, and pancreatic cancers are the leading causes of cancer deaths in females.

In Massachusetts, from 2002 to 2006, there were 178,414 newly diagnosed cases of cancer, 89,809 (50.3%) in males and 88,593 (49.7%) in females.<sup>58</sup>

During the same time period, among Massachusetts females, breast cancer was the most commonly diagnosed cancer, followed by lung, colorectal and uterine. These four cancers represented approximately 59% of new cancer cases from 2002 to 2006.

From 2002 through 2006, there were 67,266 deaths due to cancer, with 33,508 (49.8%) deaths occurring among males and 33,759 (50.2%) among females. The age-adjusted mortality rate for all cancers combined was 232 deaths/100,000 for males and 163 deaths/100,000 for females.

The next section presents Massachusetts data on incidence, mortality, screening behaviors, and racial disparities for the four cancers most commonly diagnosed in Massachusetts residents.

## Breast Cancer

Breast cancer forms in the breast tissues of both men and women, although male breast cancer is rare.<sup>59</sup> White women and elderly women are at an increased risk of developing breast cancer. Other risk factors include an early age at menarche, never having given birth or an older age at first birth, a mother or sister with breast cancer, radiation therapy to the breast or chest, obesity, and taking hormones such as estrogen and progesterone.<sup>60</sup>

### Incidence of Breast Cancer

Breast cancer was the leading cause of cancer among females in Massachusetts between 2002 and 2006, representing approximately 28% of all new cancer cases in this group.

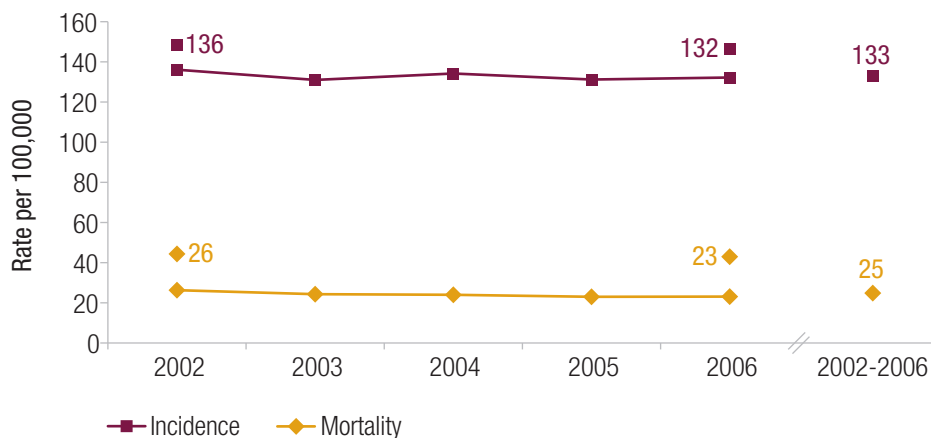
The Massachusetts rate is higher than the national rate (133 vs. 124 per 100,000). From 2002 to 2006, breast cancer incidence essentially stayed the same here while it significantly decreased nationally.<sup>61</sup>

### Mortality of Breast Cancer

Between 2002 and 2006, breast cancer was the second leading cause of death among Massachusetts females after lung cancer. It accounted for approximately 26% of all cancer deaths in females and is similar to the national rate.

There was a significant decrease in breast cancer deaths among Massachusetts females from 2002 and 2006, decreasing 3% per year. Nationally, breast cancer deaths declined 2% per year between 1996 and 2005.<sup>62</sup>

Figure 7.27 Breast Cancer Incidence and Mortality Among Females



Source: MDPH Cancer Registry, 2002-2006.

## Screening for Breast Cancer

According to the BRFSS, 85% of Massachusetts women reported having a mammogram in the past two years. Mammogram rates were similar among all racial groups.

## Prostate Cancer

Prostate cancer is a disease that develops in tissues of the prostate (a gland in the male reproductive system found below the bladder and in front of the rectum) and usually occurs in older men.<sup>63</sup> Black men are at an increased risk for prostate cancer. Others at higher risk include those over 50 years of age, and those whose brother, son, or father had prostate cancer.

## Incidence of Prostate Cancer

Prostate cancer was the most commonly diagnosed type of cancer in Massachusetts males from 2002 to 2006, representing 28% of all new cases of cancer in males.

The age-adjusted incidence rate for prostate cancer was 167/100,000 from 2002 to 2006 (Figure 7.28). During this period, US prostate cancer incidence rates were lower than those for Massachusetts (158/100,000).

In Massachusetts, prostate cancer deaths decreased between 2002 and 2006, but this decline was not statistically significant. National incidence rates for prostate cancer also decreased non-significantly during this period.

Figure 7.28 Prostate Cancer Incidence and Mortality



Source: MDPH Cancer Registry, 2002-2006.

## Mortality of Prostate Cancer

Prostate cancer was the second leading cause of cancer deaths among Massachusetts males between 2002 and 2006, representing approximately 11% of all cancer deaths in this group. From 2002 to 2006, Massachusetts



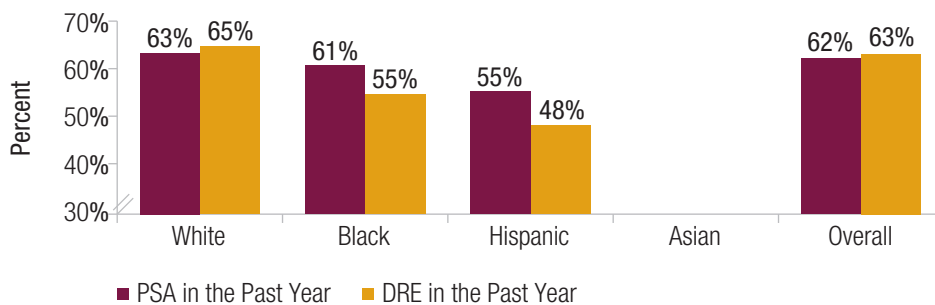
deaths due to prostate cancer decreased annually by 4.0%, however, this decrease was not statistically significant.

### Screening for Prostate Cancer

Screening for prostate cancer is performed with a PSA, a blood test used to indicate an increased risk of prostate cancer. A second method is the digital rectal exam (DRE), in which a doctor, nurse, or other health professional places a gloved finger into the rectum to feel the size, shape, and hardness of the prostate gland. Overall nearly two thirds of Massachusetts males 50 years and older reported that they had DRE exam (65%) and PSA test (63%) in 2008 (Figure 7.29).

White males had the highest screening rates at 65% for DRE and 63% for PSA compared to the other racial groups. Screening rates were lowest among Hispanics.

Figure 7.29 Prostate Cancer Screening Among Men 50+ Years



Source: MDPH BRFSS, 2008.

### Colorectal Cancer

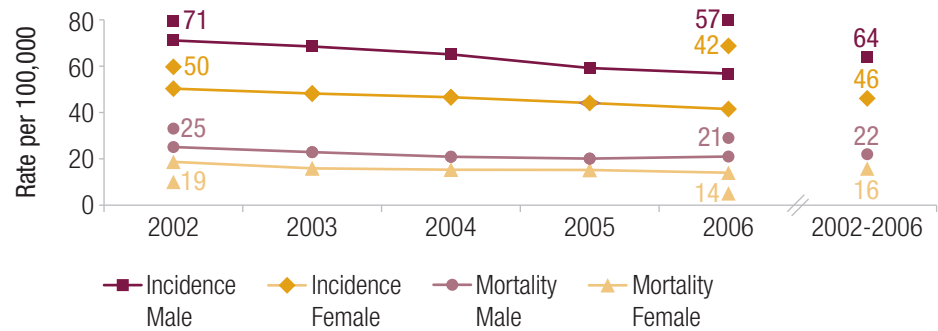
Colorectal cancer is a disease in which cancer forms in the tissues of the colon (the first several feet of the large intestines) or rectum (the last several inches of the large intestine).<sup>64</sup> Risk factors for colon cancer include being older than age 50; a personal history of colon cancer or cancer of the ovary, breast, or uterus; polyps in the colon or rectum; Crohn's disease; or ulcerative colitis. Other risk factors include a diet high in fat and animal protein and low in fiber and folic acid. Blacks also are at higher risk for colon cancer than those of other races.<sup>65</sup>

### Incidence of Colorectal Cancer

Colorectal cancer was the third most commonly diagnosed type of cancer in both Massachusetts males and females between 2002 and 2006, accounting for approximately 11% of all cases in both males and females.

The age-adjusted incidence rates for colorectal cancer were 64/100,000 among males and 46/100,000 among females. These rates are slightly higher than the US rates of 61/100,000 for males and 44/100,000 for females (Figure 7.30).

Figure 7.30 Colorectal Cancer Incidence and Mortality



Source: MDPH Cancer Registry, 2002-2006.

Colorectal cancer in males decreased significantly from 2002 to 2006 at approximately 6% per year (Figure 7.30). National data show that colorectal cancer incidence rates decreased significantly by 2% per year from 1996 to 2005 for males.

In Massachusetts the incidence rate of colorectal cancer among females decreased significantly by 5% per year from 2002 through 2006. Nationally, the incidence of colorectal cancer in females decreased significantly by 2% per year from 1996-2005.

### Mortality of Colorectal Cancer

Colorectal cancer was the third leading cause of cancer death in Massachusetts for both males and females between 2002 and 2006. It accounted for approximately 9% of all cancer deaths in males and 10% of all cancer deaths in females. During this period, the age-adjusted mortality rate of colorectal cancer was 22/100,000 for males and 16/100,000 for females (Figure 7.30).

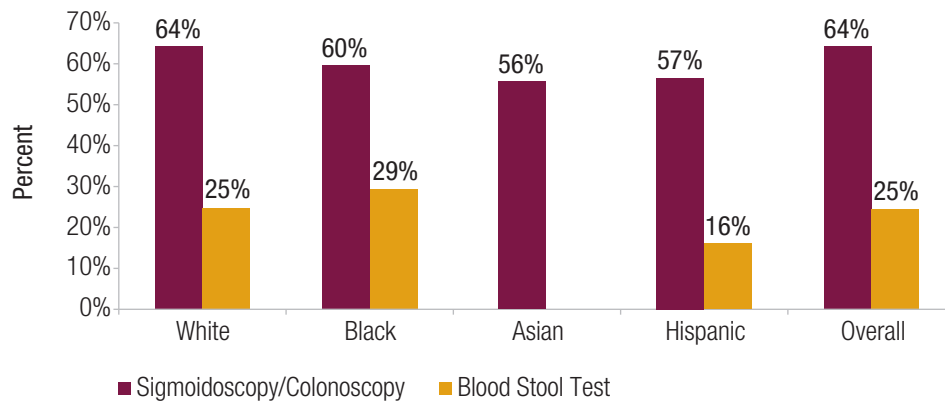
Massachusetts mortality rates among both males and females were similar to US rates. From 2002 to 2006 colorectal cancer mortality decreased by 5% per year among males and 6% per year among females.

### Screening for Colorectal Cancer

Screening procedures to detect colorectal cancer in the early stages include FOBT (a home kit to determine if the stool contains blood), and sigmoidoscopy, and colonoscopy (tests that examine the bowel for signs of cancer or other health problems).

Overall 64% of all Massachusetts adults ages 50 years and older reported having a colonoscopy or sigmoidoscopy and one in four reported having an FOBT. Screening rates were higher among Whites than in other racial groups (Figure 7.31).

Figure 7.31 Colorectal Cancer Screening Among Adults 50+ Years



Source: MDPH BRFSS, 2008.

## Lung Cancer

Lung cancer is a disease in which cancer cells develop in the lung tissue.<sup>66</sup> Tobacco use is the most important risk factor for lung cancer. Other risk factors include exposure to second-hand smoke; radon, a radioactive gas that damages lung cells; asbestos and other substances including arsenic, chromium, nickel, or tar; air pollution; a family history of lung cancer; a personal history of lung cancer; and age over 65.<sup>67</sup>

## Incidence of Lung Cancer

In Massachusetts from 2002 through 2006, lung cancer was the second most commonly diagnosed type of cancer in both males and females, accounting for 14% of all cancer cases in both genders. Lung cancer is nearly twice as common in males than in females. Lung cancer rates stayed about the same from 2002 to 2006.

## Mortality of Lung Cancer

Lung cancer was the leading cause of cancer death for Massachusetts males and females between 2002 and 2006, accounting for approximately 29% of all cancer deaths in males and 26% of cancer deaths among females. Mortality rates for lung cancer were lower in Massachusetts than in the US for males (66/100,000 vs. 72/100,000, respectively) and slightly higher for females (44.6/100,000 vs. 43/100,000, respectively).

Among Massachusetts males, mortality from lung cancer decreased significantly by 1% per year between 2002 and 2006. Among Massachusetts

females, mortality decreased non-significantly by 1% per year between 2002 and 2006.

## Disparities in Cancer

From 2002 to 2006, Black males had the highest incidence rate of all cancer types combined (Figure 7.32). This rate was significantly higher than the rates for Asians and Hispanics, but not for Whites.

Figure 7.32 Cancer Incidence and Mortality Rates Among Males

Cancer Site	All Races	White	Black	Asian	Hispanic
Incidence Rate					
All Sites	601.1	603.3	621.1	318.1	457.4
Prostate	167.1	161.8	247.3	69.2	167.5
Colorectal	64.1	64.7	53.9	43.0	46.1
Lung	85.1	87.0	88.9	50.8	39.8
Mortality Rate					
All Sites	231.9	235.0	284.7	133.0	124.2
Prostate	24.6	24.5	49.0	–	14.5
Colorectal	22.0	22.4	25.7	10.5	9.3
Lung	66.3	67.6	77.6	42.7	27.1

Source: MDPH Cancer Registry, 2002-2006.

Among men, Blacks had the highest age-adjusted mortality rates for all types of cancer combined from 2002 to 2006 (Figure 7.32). The mortality rate among Black males was significantly higher than the rates for the three other racial/ethnic groups, and these disparities were evident in each of the leading cancer types.

From 2002 to 2006, Black males had the highest rates of prostate cancer incidence (247/100,000) (Figure 7.32). This rate was significantly higher than the rates for other racial/ethnic groups. Nationally, prostate cancer incidence rates among Black males are decreasing, but the rates remain higher than among White males (236/100,000 vs. 150/100,000).

From 2002 to 2006, White males had the highest incidence rate of colorectal cancer (65/100,000), followed by 54/100,000 among Blacks, 46/100,000 among Hispanics, and 43/100,000 among Asians (Figure 7.32).

From 2002 to 2006, lung cancer was the second leading cancer among males in all racial groups, except among Hispanic males, where it was the third leading cancer. Black men had significantly higher lung cancer mortality rates compared with White men (77/100,000 vs. 68/100,000, respectively).

Figure 7.33 Cancer Incidence and Mortality Rates Among Females

Cancer Site	All Races	White	Black	Asian	Hispanic
Incidence Rate					
All Sites	460.5	470.6	385.2	286.1	327.8
Breast	132.9	136.8	112.2	75.5	88.8
Colorectal	46.1	46.4	44.2	34.2	34.8
Lung	64.1	66.9	49.8	30.8	21.6
Mortality Rate					
All Sites	163.4	166.8	177.1	86.1	86.3
Breast	24.1	24.7	29.7	8.2	14.0
Colorectal	15.8	15.9	19.7	7.8	9.9
Lung	44.3	46.3	38.5	18.3	10.7

Source: MDPH Cancer Registry, 2002-2006.

From 2002 through 2006, White females had the highest incidence rate of all cancer types combined among all racial/ethnic groups (Figure 7.33). Asian females had the lowest incidence rate of all cancers combined. Among females, the mortality rate for Black females was not statistically significantly different from the rate for White females. Both these groups, however, had significantly elevated rates when compared with Asian females.

Among women, Black females had the highest age-adjusted mortality rates for all types of cancer combined from 2002 to 2006 (Figure 7.33). The mortality rate was not statistically significantly different from the rate for White females, but both Black and White females had significantly elevated rates when compared with Asians and Hispanics.

The age-adjusted incidence rate of invasive breast cancer was significantly higher for White females than for other racial/ethnic groups. The incidence of *in situ* breast cancers rate was also significantly higher among White females (48/100,000) than among the other racial/ethnic groups. (Figure 7.33)

Among women, the highest colorectal cancer incidence rates occurred among Whites (54/100,000). The lowest rates occurred among Asians (40/100,000) (Figure 7.33).

White females had significantly elevated mortality rates of lung cancer (46/100,000) compared with the other racial/ethnic groups.

## Oral Health

Dental and oral diseases have been called the “silent and neglected epidemic”. Though every member of the population may be affected by them,

**Though every member of the population may be affected by it, little attention has been paid to the burden of dental and oral diseases.**

little attention has been paid to the burden of dental and oral diseases.<sup>68</sup> Dental and oral diseases are inflammation, degeneration and/or abnormalities associated with the teeth, gums, jaw and the surrounding craniofacial structures, such as cleft lip and cleft palate. Most recently, a relationship between oral infections and cardiovascular disease, diabetes, and bacterial pneumonia in seniors has been suggested.

Dental caries and periodontal disease are the most common dental diseases. Both are infectious and chronic, and both can be prevented. These infections are caused by colonies of bacteria commonly known as “plaque,” a sticky film that adheres to the teeth and gums. If not effectively removed daily, plaque produces toxins which damage the teeth, gums and supporting structures.

Oral and pharyngeal cancers are destructive oral diseases that can affect any part of the oral cavity, including the lips, tongue, mouth and throat. Tobacco use, alcohol consumption, prolonged sunlight exposure, and oral human papilloma virus (HPV) have all been shown to increase the risk of developing oral and pharyngeal cancer.<sup>69</sup>

**“You’re not healthy without good oral health.”**  
— **Former Surgeon General C. Everett Koop**

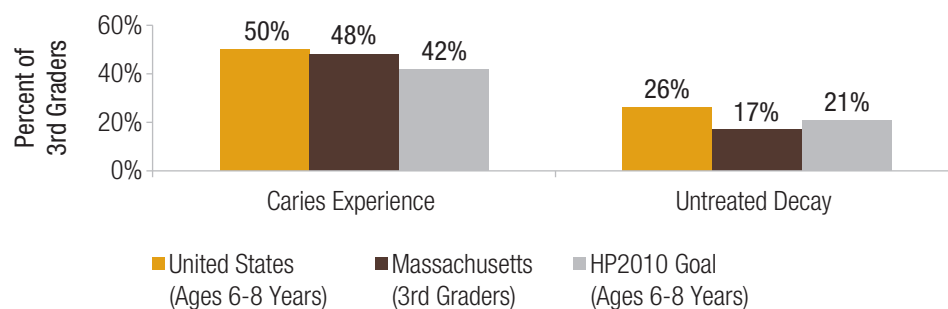
“You’re not healthy without good oral health,” said former Surgeon General C. Everett Koop. Dental and oral disease can affect an individual’s ability to eat and chew food, as well as limit their social interactions and self-esteem. It can also negatively affect a child’s ability to learn due by causing excessive absences and an inability to concentrate.<sup>70</sup>

Effective oral health prevention strategies such as community water fluoridation, dental sealants and oral screenings play an integral role in gaining and maintaining optimal oral health.

## Prevalence of Oral Disease

In children, dental decay is the most common chronic disease, five times more common than asthma. In 2004, a statewide assessment of Massachusetts children aged three to five years in the Head Start Program revealed

Figure 7.34 **Caries Experience and Untreated Decay Among Young Children**



Source: MDPH *The Status of Oral Disease in Massachusetts*, 2009.



that 37% had experienced dental decay, compared to the national average of 22%.<sup>71</sup> The prevalence of decay experience among Massachusetts 3<sup>rd</sup> graders is 48%, and the presence of untreated decay is 17%.<sup>72</sup> These rates are lower than the national averages of 50% and 26% among six to eight year-olds (comparable age group).

As children grow and mature into adolescence, dental and oral diseases are compounded by increased exposures to risk factors. Three in ten (30%) Massachusetts middle school students and 35% of high school students self-reported having a cavity during the previous year.

For adults in the Commonwealth, 34% of those aged 35 - 44 year olds have lost at least one tooth compared to 62% nationally. However, adult residents with other health conditions, such as diabetes had almost twice the prevalence of tooth loss; 30% of adults with diabetes were missing six or more teeth compared with just 12% of residents without diabetes.

Many people believe that as we age, it is natural to lose teeth, but with advances in oral health education, access to fluoridation, fluorides, and professional dental care, more and more people are keeping their natural teeth as they age. In a 2009 statewide assessment of residents ages 60 years and older living in long term care facilities, it was noted that almost 65% had some natural teeth. The assessment also found that of these individuals, 59% had untreated decay and nearly 75% had gingivitis. More than one-third of residents had no natural teeth; many of these (18%) also had no dentures (false teeth).<sup>73,74</sup>

In 2008, more than 35,000 cases of oral cancer were diagnosed in the United States. According to the Massachusetts Cancer Registry, between 1995 and 2005, 8,190 new cases of oral cancer/pharyngeal cancer were diagnosed, and there were 2,033 deaths from oral/pharyngeal cancer in the state. Though females were significantly more likely to be diagnosed at the local stage than males, from 2001 through 2005, the majority of oral/pharyngeal cancers were diagnosed at the regional stage, where the disease had spread to nearby tissues and/or body parts.<sup>74</sup>

## Disparities in Oral Health

Though dental disease affects nearly everyone, it disproportionately affects certain minorities and lower socioeconomic groups, as well as those who live in areas with limited access to dental care. Nationally, 80% of dental decay is found among just 25% of children, most of whom are minority and low income.<sup>70</sup> These rates are similar in minority and low income children in Massachusetts.<sup>74</sup>

While the statewide average of untreated decay among 3<sup>rd</sup> graders was 17%, the racial and ethnic prevalence of untreated decay was<sup>74</sup>:

- 36% among non-Hispanic Black children

**Fluoridation is the most cost effective and efficient means of preventing tooth decay for everyone in a community.**

### Community Water Fluoridation

Since the 1950's, community water fluoridation has been proven to be safe and effective in preventing tooth decay in the United States. In 1951, Danvers, Middleton and Templeton were the first three communities in Massachusetts to fluoridate their water supplies. Since that time, 140 communities provide the health and economic benefits of fluoridation to more than 3.9 million residents (59% of the population). Fluoridation is the most-cost effective and efficient means of preventing tooth decay for everyone in a community; for every \$1 spent on fluoridation, \$38 is saved in dental treatment costs. Unfortunately, of the top six most highly populated cities in the state, three do not fluoridate (Worcester, Springfield and Brockton).

## Preventing and Detecting Oral Cancer

Early detection is key. When found early through periodic screenings, the survival rate for oral cancer is 80-90%. Of those diagnosed with late stage disease, the five-year survival rate is only about 45%.<sup>75</sup> By limiting exposures to alcohol, tobacco, sunlight, and oral human papillomavirus (HPV), oral cancers may be prevented. In addition to educating the public on oral disease risk factors, medical professionals must be educated on the importance of regularly looking at the teeth, gums and surrounding structures as part of a medical examination.

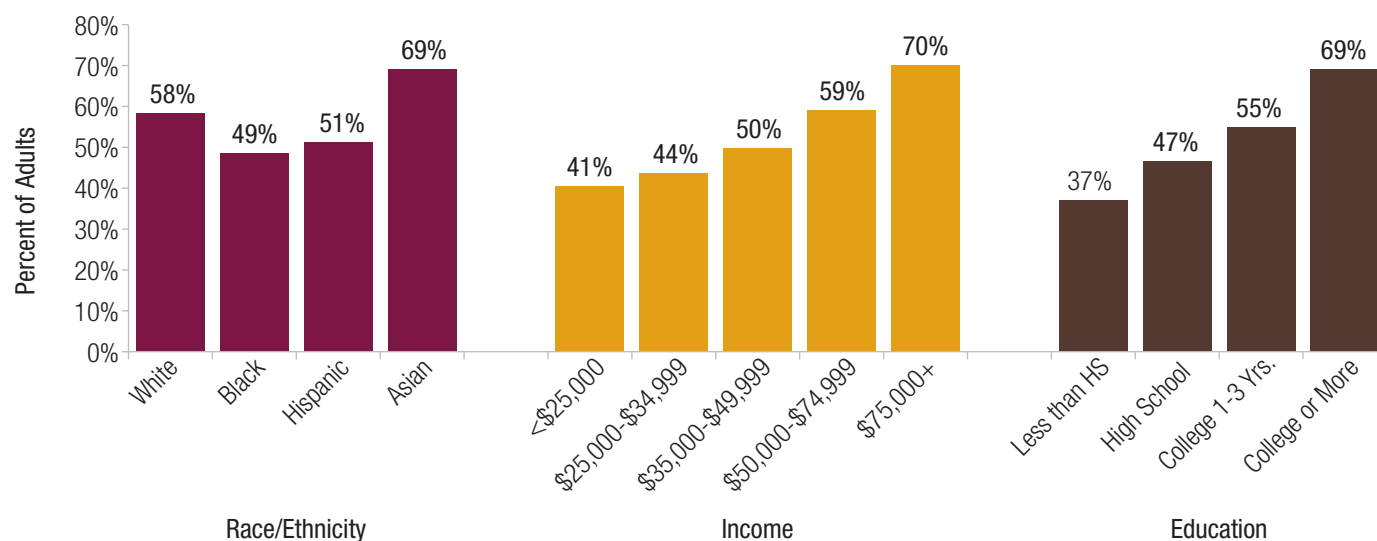
- 26% among Hispanic children
- 32% among low income 3<sup>rd</sup> graders
- 39% among children with no regular dentist

While Massachusetts adults are fairing better than the rest of the nation, a closer examination reveals that certain subgroups that have much higher rates of tooth loss. For residents with incomes less than \$25,000, 59% have lost teeth due to tooth decay and gum disease, compared to only 30% with household incomes over \$75,000. Additionally, residents with low income and lower educational levels had the highest risk for tooth loss. Sixty-three percent of those having less than a high school education had tooth loss, compared to 31% of those having a four-year college degree or more.

Access to regular dental care also plays a factor in oral health. About 1.3 million residents live in dental health professional shortage areas (DHPSA), areas of the state where there is a lack of dental care providers for community members. Of those residents living in designated DHPSA communities 29.2% did not visit a dentist in the last year compared to 22.9% of residents living in a non-DHPSA community.<sup>74</sup>

Lack of dental insurance also plays a role in dental health. The proportion of residents with any insurance coverage who visited a dentist in the last year was 80.1%, compared to 58.8% of those with MassHealth (Medicaid) and 48.3% of those with no insurance.<sup>74</sup>

Figure 7.35 No Tooth Loss Among Massachusetts Adults



Source: MDPH BRFSS, 2008.

## Effective Population-Based Prevention Initiatives for Oral Health

Oral health is an integral part of total health and must become a higher priority in health programs and policies. Effective population-based

initiatives such as water fluoridation and school sealant programs must be promoted and supported to ensure that the residents of Massachusetts have better oral health and well-being. Only then can we defeat this silent and neglected epidemic.

Preventing dental diseases requires a multi-pronged approach which includes:

- Consistent exposure to fluoride in drinking water.
- Good oral hygiene, including flossing and the effective and frequent removal of bacteria by tooth brushing with a fluoridated toothpaste.
- Minimal consumption of high carbohydrate and sticky foods.
- Minimal consumption of sucrose and high sugar drinks.
- Application of dental sealants.
- Access to early and periodic dental care.

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## Health-Related Quality of Life

Health-related quality of life refers to a person or group's perceived physical and mental health over time and is used to measure the effects of numerous conditions, short- and long-term disabilities, and diseases. Tracking quality of life in different populations can help identify sub-groups with poor physical or mental health and can help guide policies or interventions to improve their health.<sup>76</sup>

In this report we present two measures of health-related quality of life: (1) self-reported health, and (2) mental health status.

### Self-Reported Health Status

Self-reported health is a person's assessment of his or her own health. It is influenced by many factors including education, economic status, and living conditions. Self-reported health is a significant predictor of mortality and morbidity. It is useful in determining unmet health needs, identifying disparities, and characterizing the burden of chronic diseases within a population.<sup>77,78</sup>

### Prevalence

All respondents to the YHS and BRFSS were asked to describe their overall health as excellent, very good, good, fair or poor. Among Massachusetts residents, 4% of middle school students, 7% of high school students and 12% of adults 18 and over report fair or poor health.<sup>8,36</sup>

### Disparities

Although Massachusetts residents generally self-report that their health is good or excellent, there are significant differences by gender, racial and ethnic group and disability status.

### Dental Sealant Programs in Schools

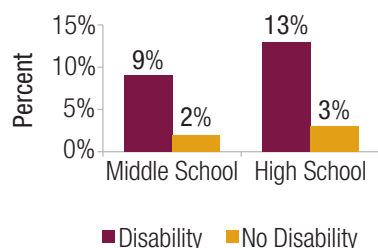
According to the CDC, if 50% of children at high-risk participated in school sealant programs, more than half of their tooth decay would be prevented and money would be saved on their treatment costs. In 2006, Massachusetts public school nurses reported only 8% of schools had a school-based dental sealant program. In 2008, a follow-up survey showed no dramatic change. To address this, the Massachusetts Department of Public Health developed the SEAL Program in 2007. Using portable dental equipment in schools, dental hygienists place sealants and fluoride to prevent tooth decay. Since its inception, more than 9,000 children now have dental sealants.

**"Health is a state of  
complete physical, mental,  
and social well-being, and  
not merely the absence of  
disease or infirmity."**

**— World Health**

**Organization, 1948<sup>79</sup>**

Figure 7.36 **Students with Fair or Poor Health by Disability Status**



Source: MDPH Youth Health Survey, 2007.

Among adolescents, 6% of female and 3% of male middle school students reported fair to poor health. Among high school students, 8% of females and 5% of males reported fair to poor health.<sup>8</sup>

Among high school students, 10% of Black students, 10% of Hispanics, and 10% of students of other races (Asians, Pacific Islanders, multiracial youth, and multiple race/ethnicities) reported fair to poor health compared to only 6% of White students.<sup>8</sup>

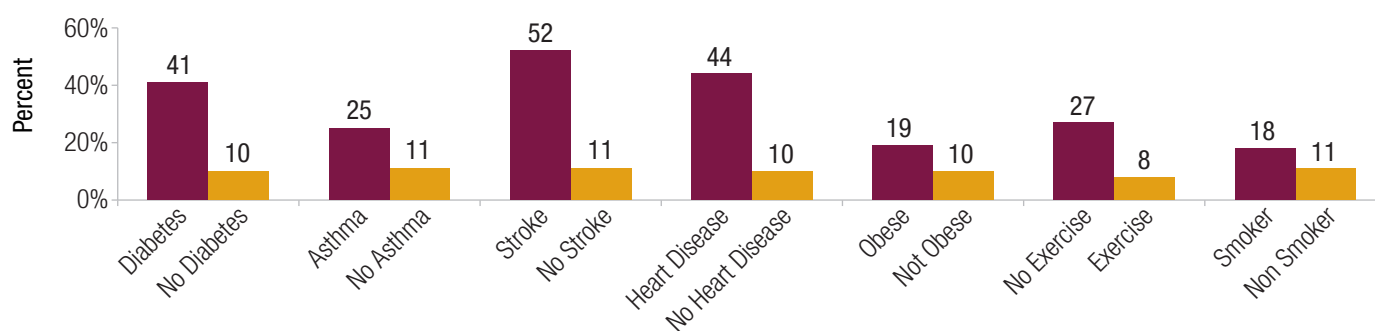
Middle school students with disabilities were more than four times as likely to report fair or poor health (9%) compared to their counterparts without disabilities (2%). Among high school students, 13% of those with disabilities reported fair to poor health compared to 3% of those without disabilities (Figure 7.36).

**Massachusetts adults with diabetes were four times more likely to report fair to poor health compared to those without diabetes.**

Disparities in self-reported health status also emerge among Massachusetts adults. In 2008 more than a quarter of Hispanics (26%) and 18% of Blacks reported fair or poor health compared to 11% of Whites and 4% of Asians. In addition, 34% of adults with a disability reported fair or poor health compared to only 6% of those without a disability.<sup>36</sup>

Massachusetts adults with chronic conditions were more likely to report fair to poor health compared to those without. This holds true for adults with diabetes, asthma, obesity and those who smoke (Figure 7.37).

Figure 7.37 **Fair to Poor Health by Conditions and Risk Factors**



Source: MDPH BRFSS, 2008.

## Mental Health

Mental health is as important as physical health to the overall well-being of individuals, societies and countries. Poor mental health, including depression and anxiety, has been correlated to unhealthy behaviors such as smoking, the decreased use of preventive services and chronic health conditions such as heart disease.

## Prevalence

Seven percent of Massachusetts adults reported 15 or more days of feeling sad, blue, or depressed in the past month.<sup>36</sup> One in four high school students (22%) and 16% of middle school students reported feeling so sad or hopeless almost every day for two weeks or more in a row that they stopped doing some of their usual activities.<sup>8</sup>

## Disparities

Though mental health problems affect all groups, disparities exist among different subgroups by gender and race and ethnicity. Twenty percent of female middle school students and 29% of female high school students reported feeling depressed compared to only 14% of male middle school students and 14% of male high school students.<sup>8</sup>

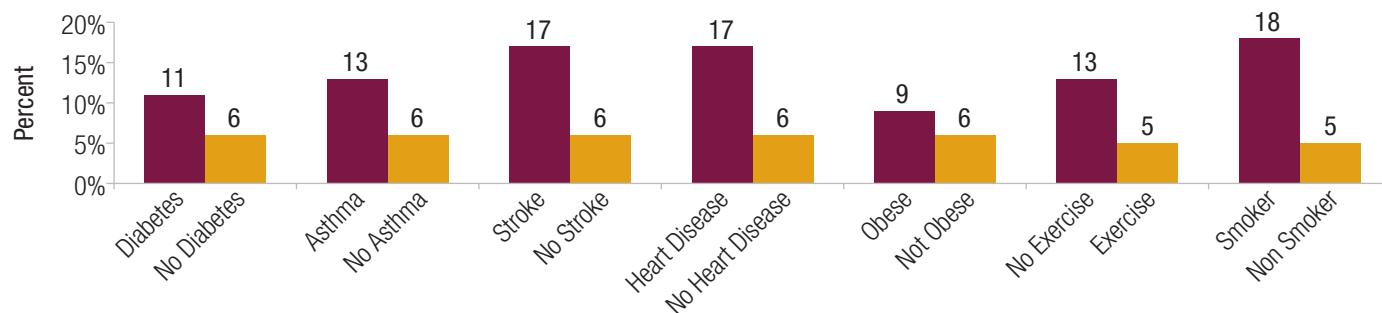
Among high school students, 34% of Hispanic students were more likely to report feeling depressed compared to 18% of Whites, 23% of Blacks, and 28% of those of other races. One-third of middle school students with disabilities reported feeling depressed compared to 9% of students without disabilities. Among high school students, 40% of those with disabilities reported these feelings compared to 13% of those without disabilities.<sup>8</sup>

In adults, poor mental health was strongly associated with smoking, obesity, lack of physical activity and chronic diseases such as diabetes and heart disease. Of current smokers, 18% reported being depressed compared to 5% of non-smokers. Of those who were obese, 9% reported being depressed compared to 6% of those who were not obese (Figure 7.38).

**Mental health problems occur across the lifespan, affecting persons of all racial and ethnic groups, both genders, and all educational and socioeconomic groups.**

**Massachusetts adults with a disability were *six times* more likely to report feeling sad, blue or depressed compared to adults without a disability.**

Figure 7.38 Adults Who Report Being Sad, Blue, Depressed



Source: MDPH BRFSS, 2008.

## Special Note on American Indian Health

Poor education and poverty are associated with poorer health outcomes and risk behaviors, and the findings for American Indians in Massachusetts are no exception. According to 2001-2005 BRFSS, more than 29% of American



Indians reported being in poor or fair health as compared with approximately 13% for the state overall. American Indians have less access to health care than Massachusetts residents overall. For example, the proportion of American Indians who reported having no health insurance was 2.3 times greater than that of the state as a whole (18% vs. 8%). The proportion of American Indian adults who reported being unable to see a doctor due to cost was more than twice that of Massachusetts overall (19% vs. 8%).<sup>80</sup> Additional indicators of poor health among American Indians are:

- The prevalence of diabetes, high blood pressure, and high cholesterol (9%, 26%, and 31%, respectively) as compared with the state (6%, 24%, and 27%, respectively).
- Only 65% of American Indians engaged in leisure physical activity as compared with 78% of residents overall.
- American Indian women ages 40 years and older who reported having a mammogram in the last 2 years was 74% vs. the state overall 83%.

American Indians in Massachusetts experience disparities in health outcomes and certain risk behaviors. Often American Indians numbers from surveillance systems such as YRBS and BRFSS are too low to draw meaningful conclusions. Hence problems may be masked and worse than they appear on the limited number of data releases that address or include American Indians. Given the limited health data pertinent to American Indians, lingering disparities, including lower life expectancy, and confounding socio-economic factors affect the health of American Indians of Massachusetts. A comprehensive and concerted effort is required to improve the health of this community.

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## Our Aging Population

As the life expectancy of Americans continues to increase, that extended longevity brings into focus the need for carefully designed and targeted primary, secondary and tertiary prevention efforts, especially since multiple co-morbid conditions frequently accompany aging.

There are more than 1.2 million residents who are 60 years or older.<sup>82</sup> As this number is projected to grow, it is important to note that health concerns increase as the population ages. Adults older than 65 are more likely to be in poor health, have a disability, not visit the dentist, have high blood pressure, diabetes or a heart attack than the rest of the population.

Dementing conditions, commonly grouped under Alzheimer's disease and related dementias (ADRDs), ranked fifth as a leading cause of death for persons aged 65 years and older. In Massachusetts as in other states, total health care costs associated with ADRDs are more than three times higher than for others aged 65 and older.<sup>81</sup> Nationally, it was estimated that unpaid caregivers provided 8.5 billion hours of care for ADRDs (valued at \$94 billion) in 2008. The enormous burden on health care expenditures,

One major health risk for older adults is falls. For more information on falls, see Chapter 11: Unintentional Injury.



prolonged caregiver stress and commitment, and the significant reduction in quality of life make ADRDs a critical area for research and policy.

In terms of prevention, older adults also fell short of Healthy People 2010<sup>83</sup> vaccination objectives: 72% reported receiving a flu shot in the past year (HP2010 target: 90%) and 67% reported pneumonia vaccination in the past year (HP2010 target: 90%). Of those aged 65 and older, Black (58%) and Hispanic adults (61%) were less likely to report having had a flu shot in the past year as compared to Whites (73%). Both Blacks (50%) and Hispanics (34%) were less likely to report ever having a pneumonia vaccination as compared to White adults (70%).



**Stuart Chipkin, MD**

Research Professor, University of Massachusetts, Amherst  
School of Public Health and Health Sciences;  
Endocrinologist and Director, Diabetes Management Program,  
Valley Medical Group

**O**ur major health burdens have become linked predominantly to our behaviors and environment. The number of Massachusetts residents suffering from chronic diseases has increased to epidemic proportions. Chronic diseases impact quantity and quality of life; the prolonged duration magnifies consequences to individuals, families, communities, and businesses throughout the Commonwealth.

Our traditional approach to chronic diseases has emphasized urgent and technological responses to late complications. Efforts for heart disease open arteries which were already clogged. Efforts for cancer destroy malignant cells after millions of them were transformed from pre-cancerous states. We allocate many more resources to the complications of diabetes than to its prevention. Our approach to asthma opens inflamed airways instead of addressing air quality and environmental triggers. We battle the consequences of dental carries in our children but haven't achieved water fluoridation in all our communities. The vast majority of our endeavors to address obesity begin after excess fat creates other health abnormalities.

To address our current health needs, we must create healthy environments by implementing successful prevention policies and programs in high-risk communities. Policies which emphasize healthier nutrition, physical activity and oral health create overlapping benefits for obesity, diabetes, cancer and heart disease. Resources to address tobacco and other substance abuse problems create overlapping benefits for asthma, cancer, oral health, heart disease and diabetes. Comprehensive master plans and mixed-use designs need to be culturally sensitive and appropriate for high-risk communities.

Infrastructural changes need to reinforce new behaviors – farmer's markets and healthy ethnic food choices can benefit dietary practices while public safety programs and available facilities can make physical activity more enjoyable. Schools, neighborhoods and workplaces must have clean air and water, and tobacco-free environments to minimize asthma and cancer risk; resources and providers are needed to detect and address pre-cancerous conditions, periodontal disease, pre-hypertension, and pre-diabetes.

Some of these actions may be achievable through incentives; resources, of necessity, will be prioritized based on measured effectiveness.

Massachusetts has made positive changes in many of these areas. We provide near-universal health care. We have programs to reduce smoking, post caloric content and eliminate trans-fat products. We are using school-based measurements to identify children at risk for obesity.

However, we have significant ethnic disparities in health care delivery and outcomes. Children in poorer communities have excess tooth decay; large numbers of Massachusetts residents have no access to dental professionals. We continue to experience soaring rates of obesity, diabetes and their related complications in urban neighborhoods. We have excess asthma-related hospitalizations in poorer neighborhoods. We have too many risk factors among patients with cardiovascular disease. Increases in chronic diseases portend that inadequate action now will rapidly result in a cascade of costs and burdens to the state and its citizens.

New policies and programs need to target prevention strategies, environmental changes and at-risk communities. Healthier food choices need to be available and affordable; excess exposure to high calorie foods needs to be limited. Safe access to facilities (schools, community centers, etc.) is important during evenings and weekends. Schools need to teach life-long skills which encourage healthy dietary choices, promote physical activity, emphasize good oral health care and avoid risks from tobacco, excess alcohol and other substances of abuse. Workplaces need on-site health care providers (medical, dental, nursing, nutrition, exercise, etc.), clean environments free of tobacco and other carcinogens, healthy food choices in eating facilities, and facilities to promote physical activity. Communities need incentives to create safe zones (playgrounds, walking paths, swimming pools) for activity, implement fluoridation and promote businesses which carry healthier foods. Policies and programs must have the flexibility to respond to local ethnic and racial preferences.

By developing policies and programs which optimize nutrition and physical activity, promote oral health, minimize exposure to harmful substances and reduce disparities, we can prevent and reduce the impact of chronic diseases on Massachusetts citizens.



# FIGURE NOTES

**Figure 7.3:** Overweight/Obesity status defined as Body Mass Index (BMI)  $\geq 25$ .

**Figure 7.4:** Obesity status defined as BMI  $\geq 30$ .

**Figure 7.7:** The category 'Other' includes American Indians or Alaskan Natives and students indicating multiple ethnicities that did not include Hispanic.

**Figure 7.8:** Regular physical activity is defined as 30 minutes of moderate physical activity on at least 5 days per week or 20 minutes of vigorous activity on at least 3 days per week.

**Figure 7.10-** More data on asthma are available in "The Burden of Asthma in Massachusetts," available at [www.mass.gov/dph/asthma](http://www.mass.gov/dph/asthma).  
**7.14:**

**Figure 7.11,** Population estimates from National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000-July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the US Census Bureau; released August 7, 2008. Available from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> as of September 5, 2008.  
**7.12:**

**Figure 7.13:** Rates shown are three-year average annual crude rates of hospitalization due to asthma by Executive Office of Health and Human Services Region. Population estimates are from 2005. Population source is the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006. Available on MassCHIP V 3.0 R323 as of 8/03/09 dataset: Population file: Census Counts 1990, Intercensal and Post-censal Estimates (1991-2005) year: 2005

**Figure 7.18:** ICD-10: E10-E14. Rates are per 100,000 age-adjusted to the 2000 US standard population. The underlying cause of death is the disease or injury that initiated the series of events leading directly to death. A contributing cause of death is a disease or injury that did not directly lead to the underlying cause but still played a part in the person's death. For example, a person with diabetes may have had an underlying cause of death due to heart disease and their diabetes was a contributing cause.

**Figure 7.19:** A1c stands for Glycosylated Hemoglobin A1c. Percentages shown are for adults with diabetes who had eye exams, foot exams and flu vaccinations within the last year. Percentages shown for A1c are for adults with diabetes who had a blood test performed at least twice within the last year. Percentages shown for Self-Monitoring of Blood Glucose are for adults with diabetes who self-monitor their blood sugar every day. US data are from 2006.

**Figure 7.21,** Rates are per 100,000 population. Age-adjusted to the 2000 US standard  
**7.22:** population. 2007 US data were not available at the time of this release.

**Figure 7.25:** Age-adjusted to the 2000 US standard population.

**Figure 7.26:** Age-adjusted to the 2000 US standard population. Insufficient diabetes  
data for the Asian population.

**Figure 7.29:** There were no data for Asian non-Hispanics due to inadequate sample size.

**Figure 7.32,** Rates are age-adjusted to the 2000 US Standard Population, per  
**7.33:** 100,000. An age-adjusted incidence rate was not calculated when  
there were fewer than 20 cases.

**Figure 7.34:** The national comparison group is children ages 6-8 years.



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# E

## Environmental Health



The relationship between environmental factors and disease continues to be a concern among the general public and public health researchers. In 2000, the PEW Environmental Health Commission found that 87% of people surveyed felt that environmental contributors to disease were either very important or more important than any other disease factor.<sup>1</sup>

The Bureau of Environmental Health within MDPH collects data on a number of environmental and health measures.

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### Evaluating Environmental Risks in our Communities

The BEH works closely with residents, communities, and local health officials across the state to evaluate contaminants in our air, water, soil and food supply.

BEH investigates suspected elevations in disease occurrence and the potential relationship to the environment.

BEH also evaluates indoor air quality in public buildings, posts information on state beaches that are safe for swimming, and enforces regulations such as the state sanitary code.

**“We can prevent many  
diseases and injuries that  
result from health hazards  
in the home...”**

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## Housing

In June 2009, the US Surgeon General issued a *Call to Action* to promote healthy homes, and stated, “We can prevent many diseases and injuries that result from health hazards in the home...”

The *Call to Action* includes strategies to prevent childhood lead poisoning and control indoor air pollutants that trigger asthma and allergies.

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## Lead Poisoning

Although lead-based paints were banned for use in housing in 1976, they continue to be the most important source of elevated blood lead levels in children. Lead can harm children’s brain, kidneys, and nervous system. Even low levels of lead can make it hard for children to learn, pay attention, and behave.

The older the home, the more likely it is to contain lead paint. Deteriorating paint and paint disturbed during remodeling produce lead dust and can contaminate soil around a home. Children can be exposed by normal hand to mouth activity.

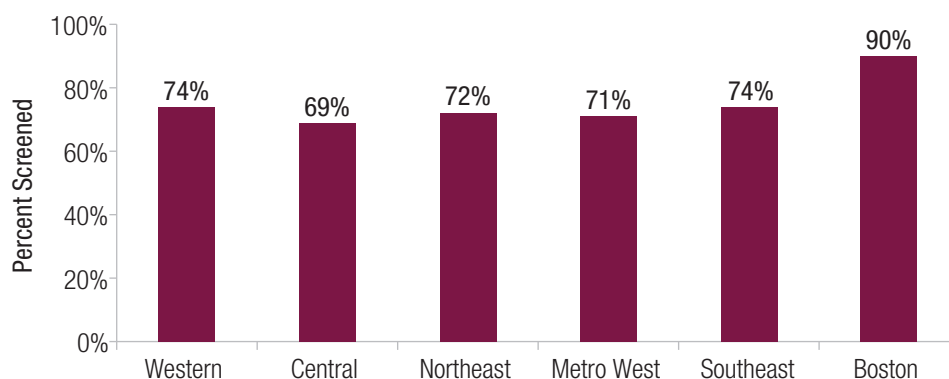
The Massachusetts lead law requires the removal or covering of lead paint hazards in homes built before 1978 where any children under the age of six reside.

The Massachusetts Lead Poisoning Prevention and Control Act requires all children up to age three (age four in high-risk communities) to have their blood tested for lead.

Every child in Massachusetts must be tested for lead exposure between the ages of nine and 12 months, and again at the ages of two and three years (four years in high-risk communities). The test involves a small amount of blood drawn from the finger or arm. If a child has an elevated blood lead level, the child’s health care provider can prescribe treatment. Massachusetts is one of only five states that require universal lead screening.

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Figure 8.1 **Childhood Lead Poisoning Screening Rates by EOHHHS Region**



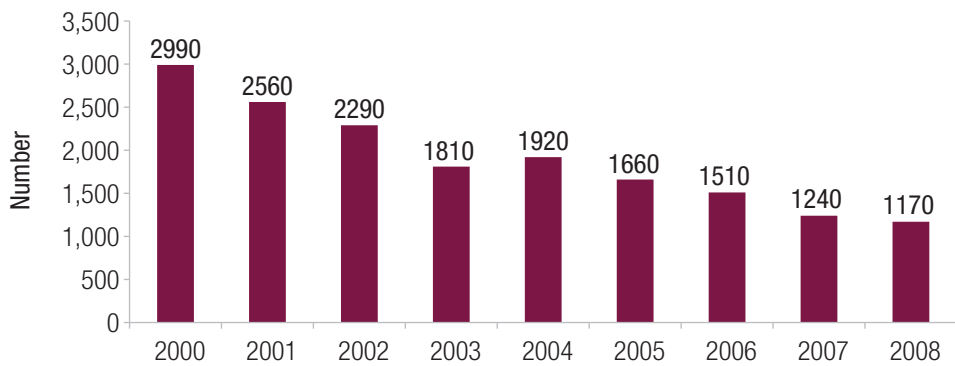
Source: MDPH, Childhood Lead Poisoning Prevention Program.

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DPH reaches out to health care providers to increase screening rates, particularly in high-risk communities. Massachusetts has consistently had the highest childhood lead poisoning screening rates in the country.

The US Centers for Disease Control and Prevention considers a blood lead level of 10 micrograms per deciliter or greater to be a *level of concern* that should be followed by public health officials.<sup>2</sup> If a child’s lead level is 25 or more, he or she is considered to have lead poisoning.

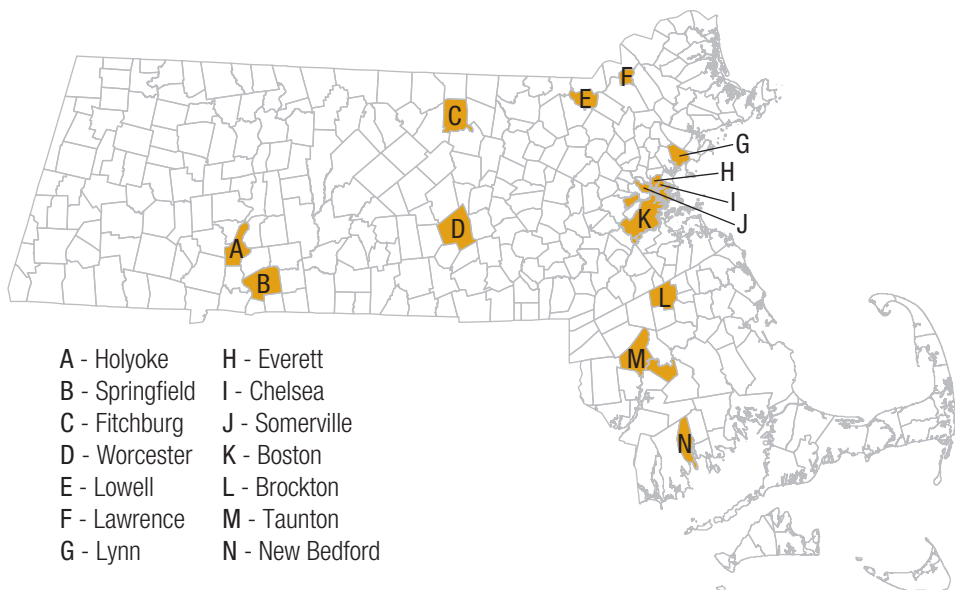
Figure 8.2 Children (9-48 Months) with Blood Lead Levels  $\geq 10$



Source: MDPH, Childhood Lead Poisoning Prevention Program.

Despite the reduction in overall state rates, 95% of Massachusetts children with lead poisoning live within fourteen high-risk communities, where 62% of the housing units were built prior to 1950. Statewide, only 44% of

Figure 8.3 High-Risk Communities for Childhood Lead Poisoning  
July 1, 2003 through June 30, 2008



Source: MDPH, Childhood Lead Poisoning Prevention Program.

housing units were built before 1950. Low income and minority children comprise a large percentage of these populations.

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## Asthma and Allergies

Asthma is a chronic inflammatory disease of the airways. The airways become constricted due to swelling and excessive mucous production in response to exposure to environmental triggers. Symptoms of asthma are wheezing, coughing, chest tightness, and trouble breathing.

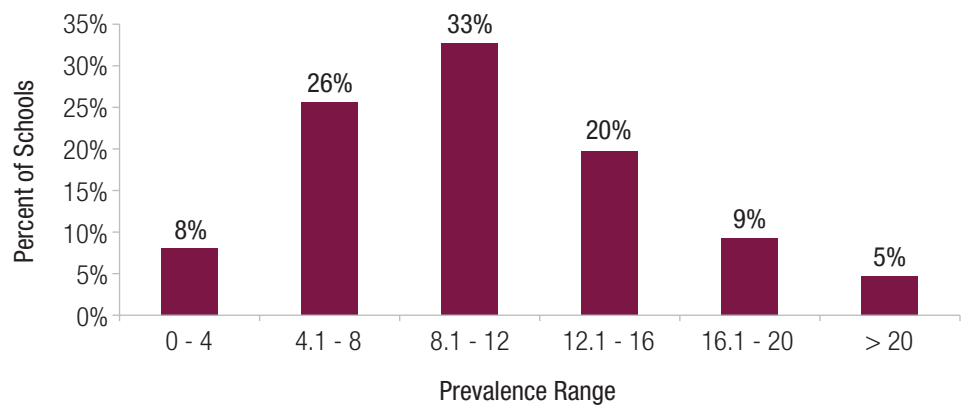
Asthma is the most common chronic disease in children in the US, and Massachusetts has one of the highest rates of pediatric asthma in the country. The impacts of indoor and outdoor pollution are thought to play an important role. Also, Massachusetts has more complete surveillance data than any other state in the country which may, in part, account for its high rates.

Acute asthma attacks can be triggered by indoor and outdoor air pollutants and allergens such as mold.

Since 2002, the Department of Public Health has tracked the prevalence of pediatric asthma in students in kindergarten through grade eight using school health records.

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Figure 8.4 **Prevalence of Pediatric Asthma in Schools**



Source: MDPH Bureau of Environmental Health.

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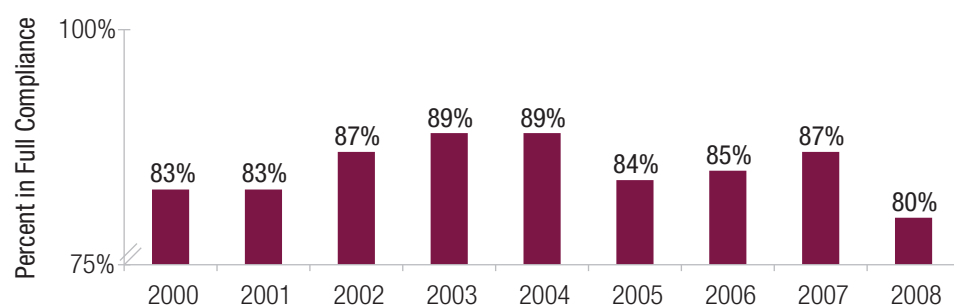
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## Drinking Water

Working closely with the Massachusetts Department of Environmental Protection, which regulates public drinking water supplies, DPH is mandated to provide technical support when either public or private water supplies are threatened with chemical, bacteriological, or radiological contamination.

Look for more asthma data in Chapter 7: Wellness and Chronic Disease.

Figure 8.5 **Public Water Supplies in Full Compliance with Monitoring/Reporting Requirements**



Source: Massachusetts Department of Environmental Protection, Bureau of Resource Protection.

## Swimming

There are more than 1,100 public and semi-public freshwater and marine bathing beaches in the state. Under the Massachusetts Beaches Act of 2001, beaches must be monitored for bacterial contamination in the water during the bathing season

Swimming in water polluted by bacteria can cause gastrointestinal symptoms such as vomiting and diarrhea; respiratory symptoms such as sore throat and cough; eye and ear symptoms such as earache and irritation; dermatologic symptoms such as skin rashes and itching; and flu-like symptoms such as fever and chills. Beaches with high bacterial levels must be posted by the local Board of Health to prohibit recreational use of the water.

**Causes of high bacteria levels include rain events, greater bather use, pet waste, spring tides, decaying plants, and illegal discharge of boat waste.**

Figure 8.6 **Samples Collected at Beaches with High Bacteria Levels**

Year	Marine Beaches			Freshwater Beaches		
	Exceedances	Total Samples Analyzed	%	Exceedances	Total Samples Analyzed	%
2001	444	7200	6.2	336	5651	5.9
2002	185	6686	2.8	264	6473	4.1
2003	311	7451	4.2	333	6480	5.1
2004	336	7868	4.3	267	7313	3.7
2005	369	8073	4.6	286	7148	4
2006	404	8361	4.8	279	7438	3.8
2007	247	7674	3.2	236	7977	3
2008	433	7636	5.7	325	7834	4.1
Average	341	7619	4.5	291	7039	4.3

Source: MDPH Bureau of Environmental Health.

Increases in bacterial contamination in 2008 were likely due to increased rainfall.

BEH maintains information on safe water at public beaches at [http://mass.digitalhealthdepartment.com/public\\_21/index.cfm](http://mass.digitalhealthdepartment.com/public_21/index.cfm).

Under the state sanitary code, DPH also regulates public and semi-public swimming pools to prevent illness and injury. The regulations enforced by DPH cover the construction, operation, and maintenance of these pools.

### Indoor Air

One in five people in the US – nearly 55 million people – spend their days in elementary and secondary schools. The US Department of Education reported in 1999 that one in five of the nation’s 110,000 schools reported unsatisfactory indoor air quality, and one in four schools reported unsatisfactory ventilation.<sup>3</sup> Indoor air allergens (substances that can cause allergic reactions) include mold, dust, and animal dander.

Molds produce allergens, irritants, and in some cases, potentially toxic substances (mycotoxins). In sensitive individuals, inhaling or touching mold or mold spores may cause immediate or delayed allergic reactions. These reactions can include hay fever-type symptoms, such as sneezing, runny nose, red eyes, and skin rashes. Allergic reactions to mold are common. Molds can also cause asthma attacks in people with asthma who are allergic to mold. In addition, mold exposure can irritate the eyes, skin, nose, throat, and lungs of both mold-allergic and non-allergic people.

Figure 8.7 Asthma Prevalence in Schools by Moisture/Mold Problems

Asthma Prevalence	No. of Schools	Schools With Moisture/ Mold Problems	Schools Without Moisture/ Mold Problems
High (12.1-22%)	21	90%	10%
Moderate (8.1-12%)	43	74%	26%
Low (0-8%)	39	51%	49%

The key to mold control is moisture control.

Source: MDPH Bureau of Environmental Health.  
Statistically significant difference between two school groups ( $p \leq 0.01$ ).

### Skating Rinks

To ensure the health and safety of patrons who use indoor skating rinks, Massachusetts is one of only two states that regulate the indoor air concentrations of carbon monoxide and nitrogen dioxide in public and private skating rinks. These gases are produced by ice resurfacing and edging equipment powered by combustible fuels such as gasoline and propane.

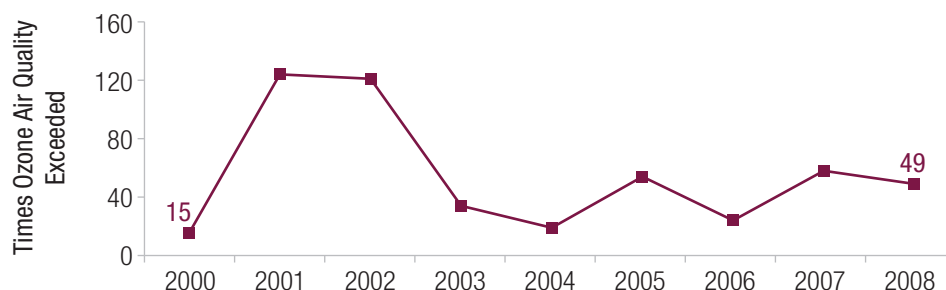


Indoor ice rink operators who use this type of equipment must conduct air sampling for these gases; maintain a log book of the air measurements; and take action to reduce the levels of carbon monoxide and nitrogen dioxide when necessary. Rinks that use electric equipment are exempt from DPH regulations.

## Ambient Air

Exposure to ambient (outdoor) air pollution, including particulate matter and ozone, has been linked to a wide range of cardiovascular and respiratory health effects. Sensitive individuals, such as the elderly and people with pre-existing heart disease or chronic obstructive pulmonary disease (COPD), are particularly vulnerable. Air pollutants such as particulate matter, ozone, and sulfur dioxide can trigger asthma attacks. Exposure to particulate matter has also been shown to increase the rate of heart attacks, arrhythmia, and premature death.

Figure 8.8 Times Ozone Air Quality Standard Exceeded



Source: Massachusetts Department of Environmental Protection, Bureau of Waste Prevention.

## Food Safety

Food poisoning can occur when food becomes contaminated with bacteria, viruses, parasites, toxins, or chemicals. The US Centers for Disease Control and Prevention estimate that there are 76 million cases of food poisoning or foodborne illness in the US each year. An estimated 300,000 hospitalizations and 5,000 deaths occur each year from foodborne illness. The actual number of illnesses may be much higher since many non-serious food-related illnesses are not reported to health officials.

Although some contaminants can cause illness within minutes, others can take days or several weeks to cause symptoms.

DPH's Food Protection Program works with local health officials to facilitate food recalls and to investigate and track reports of suspected and confirmed



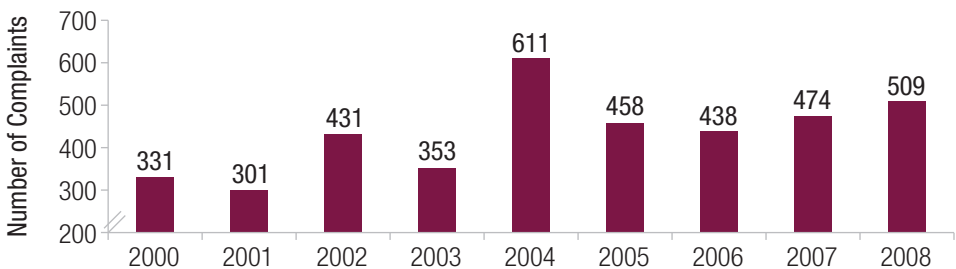
In April 2009, ESPN ran a feature story – "Danger in the Air" – on the dangers of ice rink pollution, using Massachusetts as an example of a state that has acted to control pollutants in indoor skating rinks.

The Air Quality Index, or AQI, is broadcast during local TV and radio weather reports to alert residents about health risks from air pollution.

It normally takes  
12 - 72 hours for  
symptoms of salmonella  
poisoning to appear.

foodborne illnesses. If a pattern is found among the reports, DPH investigates to identify the source of the contamination. In the case of food recalls, DPH works with local health officials to locate the adulterated food and, if appropriate, issue embargoes and require destruction of the food products.

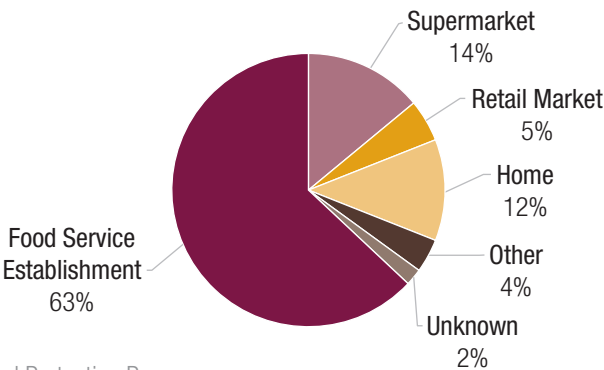
Figure 8.9 Complaints of Suspected Foodborne Illness



Source: MDPH Food Protection Program.

Campylobacteriosis and salmonellosis are the most commonly reported bacterial foodborne illnesses in Massachusetts and in the US. Food purchased in food service establishments is identified in the majority of complaints reported.

Figure 8.10 Suspected Foodborne Illness Complaints by Type of Food Establishment



Source: MDPH Food Protection Program.

The Cardinal Rule of Safe Food Preparation: Keep everything clean!

Foodborne illnesses can be prevented or minimized by effective hand washing, keeping dishcloths and sponges clean, and sanitizing surfaces such as cutting boards and sinks.

### Reducing Environmental Health Risks in our Communities

Whether it is enforcing regulations, evaluating contamination in our environment, or conducting community health assessments, preventing or mitigating environmental exposure opportunities is an important component of maintaining and improving the public's health.



**Joseph Brain, SD**

Cecil K. and Phillip Drinker Professor of Environmental Physiology, Harvard School of Public Health

**T**here are dramatic secular and geographical differences in life expectancy, infant mortality, and other health indices. Babies born in Massachusetts today will live more than twice as long as their counterparts a century ago, and more than twice as long as babies born today in sub-Saharan Africa. Why? The most important determinants of life expectancy relate to the environment. The air we breathe, the water we drink, the homes we live in, our occupation, and the choices we make are critical determinants of our health. Genetics and access to healthcare are important, but matter less.

Investment in environmental health strategies such as systematic exposure assessment should be consistent with this reality. In particular, we need to emphasize children. They are the future of our families and of the Commonwealth. Moreover, children are particularly vulnerable to environmental toxins. There is abundant evidence that early childhood, as well as embryonic development prior to birth, are critical determinants not only of a healthy childhood, but of adult health as well. There are well demonstrated links between early exposures to toxins and later outcomes in children and adults. We must continue to explore critical periods of human development and the most vulnerable populations by virtue of their genetics, geographical location, or behavior.

Our public health efforts must be based on rational, science-based health policies as well as on accurate, extensive environmental and health surveillance data. We often know what to do, but lack the staff and resources to implement effective programs in environmental health. The Commonwealth of Massachusetts has an outstanding record. We need to maintain this momentum and increase our efforts, especially in regard to those who are poorest and most affected by environmental insults.

# FIGURE NOTES

**Figure 8.1:** The population is the number of children aged nine to 48 months of age in each EOHHS region, based on the 2000 US Census. The percent screened is based on the number of children in this age group screened for lead poisoning between July 1, 2007 and June 30, 2008.

**Figure 8.2:** The counts represent the number of children in Massachusetts 9 to 48 months of age with blood lead levels of 10 or greater micrograms of lead per deciliter of blood, as confirmed by either a venous test or two capillary tests within 84 days. CDC considers a level of 10 or greater as a level of concern.

**Figure 8.3:** High-risk communities are defined based on a comparison of the incidence of blood lead levels in the community to the statewide incidence. The incidence rates are adjusted for socioeconomic status and age of the housing stock.

**Figure 8.4:** The Massachusetts Department of Elementary and Secondary Education provided total enrollment figures for public schools. Private schools provided their enrollment totals. Prevalence estimates are based on 2,075 participating public, private, and charter schools, representing 97% of the K-8 school population in Massachusetts.

**Figure 8.5:** Refers to compliance with monitoring/reporting requirements for health-based drinking water standards, according to 310 CMR 22.00. Data presented in *Environmental Progress Report FY 2009: Drinking Water*. Available at: <http://www.mass.gov/dep/water/priorities/09water.pdf>.

**Figure 8.6:** For marine beaches, the indicator species is *Enterococcus*. For freshwater beaches, the indicator species is *E. coli* or *Enterococcus*. A sample exceedance is based on comparison to the appropriate water quality criterion. Data are presented in *Marine and Freshwater Beach Testing in Massachusetts Annual Report: 2008 Season*. Available at: <http://www.mass.gov/dph/topics/beaches.htm>.

**Figure 8.7:** For 2003/2004 through 2005/2006 school years.

**Figure 8.8:** Refers to exceedance of the 8-hour ozone air quality standard. Data available at: [http://www.mass.gov/dep/air/aq/pollutants\\_ozone.doc](http://www.mass.gov/dep/air/aq/pollutants_ozone.doc).

**Figure 8.9:** Available from the MDPH Working Group on Foodborne Illness Control.

**Figure 8.10:** Available from the MDPH Working Group on Foodborne Illness Control.

# ENDNOTES

- 1 Pew Environmental Health Commission. America's Environmental Health Gap: Why the Country Needs a Nationwide Health Tracking Network, Companion Report. Prepared by the Environmental Health Tracking Project Team at Johns Hopkins School of Hygiene and Public Health. September 2000. Available at: <http://healthyamericans.org/reports/files/healthgap.pdf>.
- 2 Centers for Disease Control and Prevention, Lead [homepage]. <http://www.cdc.gov/nceh/lead/>
- 3 US Department of Education, National Center for Education Statistics. Condition of America's Public School Facilities: 1999. Washington, D.C. 2000.







# Occupational Health



Massachusetts workers drive our economy, from the cutting edge sectors of biotechnology and health care to the traditional jobs in fishing and construction that give our Commonwealth much of its character. While work is fundamental to well being, working conditions can also negatively affect health. This is most obvious in jobs such as construction where many dangers are well recognized, but exposure to chemicals, chronic wear and tear, and stress at work can also take a toll.

Each year, thousands of people in Massachusetts are injured or become ill as a result of health and safety hazards in the workplace. These work-related health problems result in substantial human and economic costs, not only for workers, their families and employers but also for society at large. They also add to the burden on our health care system. Occupational injuries and illnesses are in large part preventable. Workplace hazards should not be simply accepted as part of the job. There is extensive evidence that with effort, occupational risks can be reduced or eliminated.

Successful approaches to making workplaces safer and healthier begin with collecting and analyzing the data necessary to understand the problems. The MDPH Occupational Health Surveillance Program (OHSP) uses multiple public health data sources to document where and how workers in Massachusetts are getting sick or hurt on the job.<sup>1</sup>

**Occupational injuries and illnesses are in large part preventable. Workplace hazards should not be simply accepted as part of the job.**

OHSP uses data to target prevention activities and works with a wide range of government and community partners to address identified workplace health and safety problems. Activities include interventions in individual worksites, educational outreach to workers, employers, and health care providers, recommendations for changes in equipment design, and development of public policies to reduce workplace risks. Many stakeholders – employers, unions, the medical community, advocacy organizations and government – have critical roles to play in promoting the health and safety of working people in the Commonwealth. Information provided by OHSP helps guide these efforts.

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## Fatal Injuries at Work

Each week, one to two workers are fatally injured on the job in Massachusetts. OHSP not only collects and analyzes data on these tragic deaths but also conducts in-depth investigations of select incidents to learn more about why these deaths occur. This information is used to develop recommendations to prevent similar deaths in the future. Findings as well as prevention recommendations are disseminated widely to those in positions to make jobs safer.

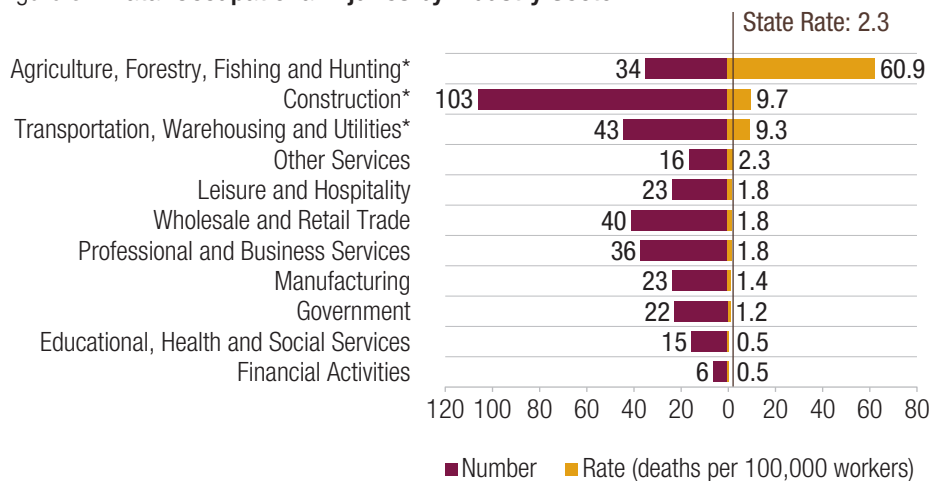
In recent years (2000-2007), the number and rate of workers killed on the job in Massachusetts has fluctuated over time, with no consistent upward or downward trend. The overall fatality rate is about half the US rate, which is partly explained by differences in industry makeup. A smaller proportion of Massachusetts workers are employed in higher risk industries such as agriculture and mining compared to other parts of the US.<sup>2</sup>

Commercial fishing stands out as an exceptionally high risk job in Massachusetts. Twenty-nine of the 535 workers fatally injured during 2000-2007 were employed in the fishing industry, and Massachusetts ranked second following only Alaska in the number of commercial fishing deaths during this period (Figure 9.1). The commercial fishing industry is vital to the economies of some Massachusetts port towns, and Massachusetts can learn from success in Alaska where efforts to expand safety training programs and increase adherence to safety standards have reduced the fishing fatality rate by nearly 50 percent.<sup>3</sup>

Construction workers – who build our homes and schools and repair our roads – are also at high risk. During 2000-2007, more workers were killed in construction than in any other industry, and the fatality rate for construction was more than four times higher than the overall state rate (Figure 9.1). The nature and organization of work in the construction industry especially in residential construction (e.g., transient worksite, small company size) make it challenging to reach workers for education and intervention. Innovative efforts are needed to reach employers and workers as well as the homeowners who contract with them.

The fatal occupational injury rate for fishermen in Massachusetts during 2000-2007 was more than 80 times the overall rate for the state.

Figure 9.1 **Fatal Occupational Injuries by Industry Sector**



Source: MDPH Census of Fatal Occupational Injuries, 2003-2007.

\*Rate statistically different from the overall state rate ( $p < 0.05$ ).

Falls from heights such as from ladders and roofs account for more work-related deaths in Massachusetts than any other type of event. During 2000-2007, almost one-fifth (19%) of all fatal occupational injuries were falls from heights (Figure 9.2). Most of these falls (69%) occurred in construction. OHSP disseminates fall prevention materials in multiple languages to workers and employers in the construction industry. OHSP has also convened a task force to identify and collaborate on strategies to reduce falls in residential construction. Members include stakeholders from industry, labor, community organizations, researchers and government agencies.

Roadway motor vehicle incidents and workplace homicides also stand out as common causes of fatal occupational injuries. During 2000-2007, 22 of the 49 workers killed in vehicle crashes were truck drivers, and truck driving claimed more lives than any other single occupation. Forty-nine workers were victims of workplace homicide. Robbery was the leading motive for these violent deaths.

Approximately one in five workers fatally injured at work was born outside of the US. During 2000 – 2007, the fatality rate for foreign born workers was higher than the rate for workers born in the US.

Government agencies can face many barriers to obtaining information from the employers and co-workers of immigrants who die on the job. OHSP has partnered with community organizations that work with newcomer communities to learn more about the incidents and the victims. These collaborations have enabled OHSP not only to collect better information but also to provide information back to the affected communities about the causes of these deaths and ways to prevent them in the future. Community partners have used OHSP reports to educate their members and mobilize action to reduce workplace health and safety risks. These



#### **Floor Sanders Killed When Floor Finishing Product Catches Fire**

Within a 10 month period (Sept. 2004-July 2005), three Vietnamese floor finishers were fatally injured in two separate incidents when a highly flammable sealer they were using caught fire. OHSP investigated these incidents and joined with the State Fire Marshal to issue a Fire Safety Alert (available in English and Vietnamese) that was disseminated to floor finishers, fire departments, insurers, and product distributors throughout the state. OHSP has also participated in a community-initiated floor finishing task force which is working to prohibit the use and sale of highly flammable floor finishing products in Massachusetts.

Figure 9.2 **Fatal Occupational Injuries by Event (Cause)**

Event/Exposure	Number of Fatalities	Percent
<b>Transportation Incident</b>	<b>166</b>	<b>31.0</b>
Roadway motor vehicle	49	9.2
Worker struck by vehicle	44	8.2
Water vehicle	35	6.5
Off road motor vehicle	20	3.7
Aircraft	17	3.2
<b>Fall</b>	<b>117</b>	<b>21.9</b>
Fall from height	102	19.1
Fall on same level	14	2.6
<b>Contact with Object or Equipment</b>	<b>91</b>	<b>17.0</b>
Struck by object	55	10.3
Caught in/compressed by object/equipment	36	6.7
<b>Assault or Violent Act</b>	<b>90</b>	<b>16.8</b>
Homicide	49	9.2
Suicide/self-inflicted injury	39	7.3
<b>Exposure to Harmful Substance or Environment</b>	<b>43</b>	<b>8.0</b>
Contact with electric current	20	3.7
Other exposure to harmful substances	16	3.0
Oxygen deficiency (includes drowning)	7	1.3
<b>Fire or Explosion</b>	<b>27</b>	<b>5.1</b>
<b>Total</b>	<b>535</b>	<b>100.0</b>

Source: MDPH Census of Fatal Occupational Injuries, 2000-2007.

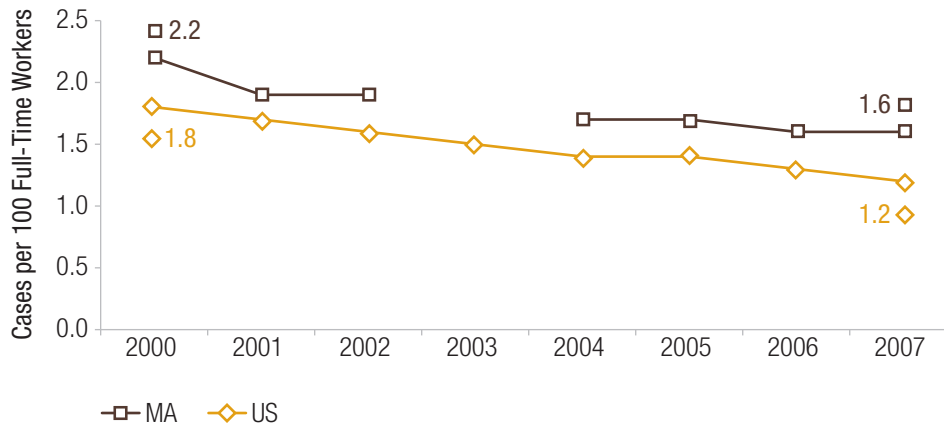
organizations reach employees and employers with potentially life-saving information through informal communication networks as well as the ethnic media including radio, cable television, web sites, and newspapers in Portuguese, Spanish, and Vietnamese.

### Nonfatal Injuries and Illnesses

Each year in Massachusetts, 1 out of every 25 full-time workers in the private sector – almost 90,000 workers – sustains a nonfatal injury or illness at work that requires more than first aid. Over 40% of these injuries and illnesses are serious enough to result in lost work time. While the rate of lost time injury and illness in Massachusetts declined from 2000-2007, it remained consistently higher than the rate for the nation (Figure 9.3).

Workers employed in transportation and warehousing are at highest risk for injury, with more than four out of every 100 full-time workers experiencing a work-related injury or illness resulting in lost work time

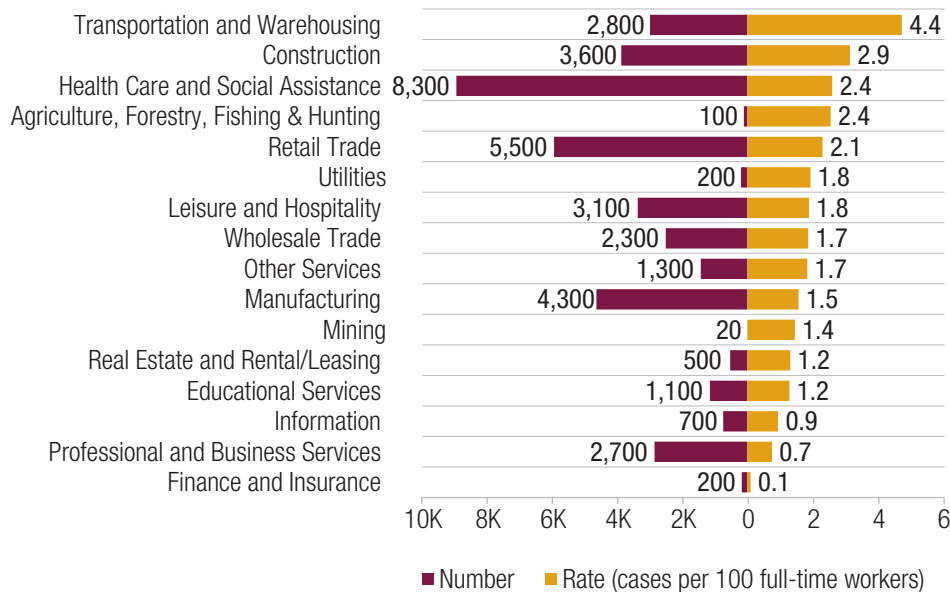
Figure 9.3 Nonfatal Occupational Injuries and Illnesses Resulting in Lost Workdays



Source: US Dept. of Labor Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses.  
 \*The MA rate decreased over time but was significantly higher than the US rate ( $p < 0.05$ ).

in 2007. Construction workers also have a high lost time injury rate. However, the largest number of lost work time injuries and illnesses – more than 8,300 cases in 2007 – occur among Massachusetts health care workers (Figure 9.4).

Figure 9.4 Nonfatal Occupational Injuries and Illnesses Resulting in Lost Workdays, by Industry Sector, MA



The statewide rate of injuries and illnesses resulting in lost workdays is **1.6**.

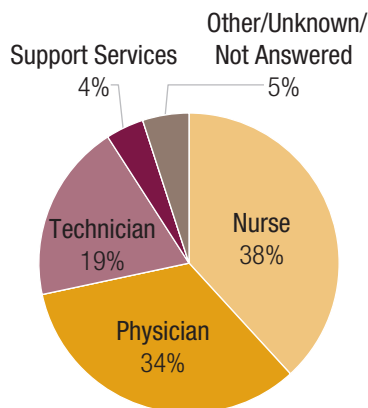
Source: US Dept. of Labor Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses, 2007.

The large number of injured workers in health care results partly from the fact that health care is the largest industry in the state, employing close to 15% of the workforce, but it is also due to the nature of the work. In fact, in 2007, the rate of lost time injuries and illnesses for health care workers

(2.4 injuries per 100 full-time workers) was higher than the rates for most other industries and higher than the rate for the health care industry in the nation as a whole (1.4). The rates for workers employed in hospitals (3.0) and nursing homes (3.9), specifically, were higher than the rates reported for workers employed in construction (2.9) and manufacturing (1.5). Close to 40% of the injuries and illnesses among Massachusetts health care workers were musculoskeletal disorders.

The survey providing these nonfatal injury and illness statistics is based on a sample of occupational illness and injury logs maintained by employers. This survey provides valuable information but has a number of well-recognized limitations. It excludes public sector workers, the self-employed, and household workers, who together comprise close to 21% of the workforce. Occupational illnesses, which can take many years to develop and may not become evident until long after an individual has left the job, are not well documented in the survey, and there is evidence that even many injuries are never reported. Therefore, OHSP uses a variety of additional health data sources, including emergency department records, workers' compensation claims, and physician reports as well as data from interviews and investigations to provide a more complete picture of the occupational health status of the Massachusetts population.

Figure 9.5 **Sharps Injuries Among Hospital Workers by Occupation**



Source: MDPH Sharps Injury Surveillance System, 2002-2007.

### Sharps Injuries Among Hospital Workers

Health care workers are vulnerable to infectious disease resulting from injuries with contaminated needles and other sharp devices. These sharps injuries are frequent events with rare but serious health outcomes (e.g., HIV, Hepatitis B, and Hepatitis C).

Since 2001, hospitals licensed by MDPH have been required by state and federal law<sup>4,5</sup> to use sharps with engineered sharps injury protections (SESIPs).

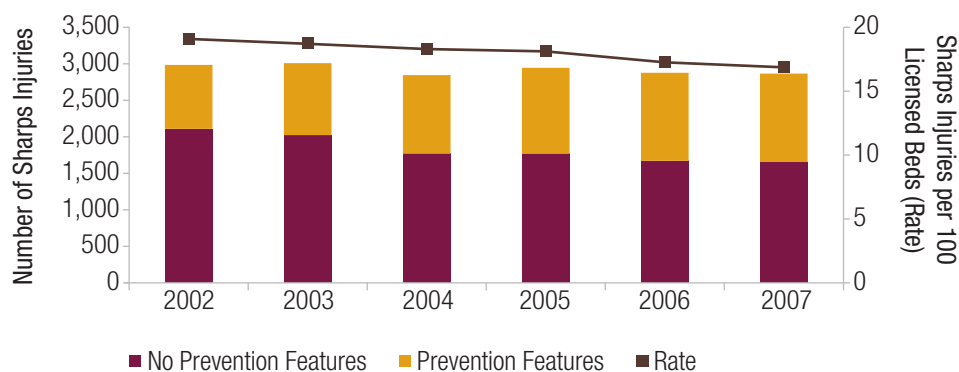
Hospitals are also required to maintain logs of sharps injuries among workers and submit data from these logs annually to OHSP, which maintains the Massachusetts Sharps Injury Surveillance System. Since 2002, the Sharps Injury Surveillance System has collected data each year from 99 MDPH licensed hospitals.

More than 3,000 sharps injuries among hospital workers are reported to MDPH annually. Nurses are most frequently injured, followed by doctors and technicians. Non-clinical staff (e.g., housekeepers and central supply staff included in support services) are also at risk (Figure 9.5).

Since the Massachusetts Needlestick Prevention Act was passed in 2001, the rate of sharps injuries has gradually decreased by an average of 4.8 % annually (Figure 9.6).



Figure 9.6 Number and Rate of Sharps Injuries Among Hospital Workers



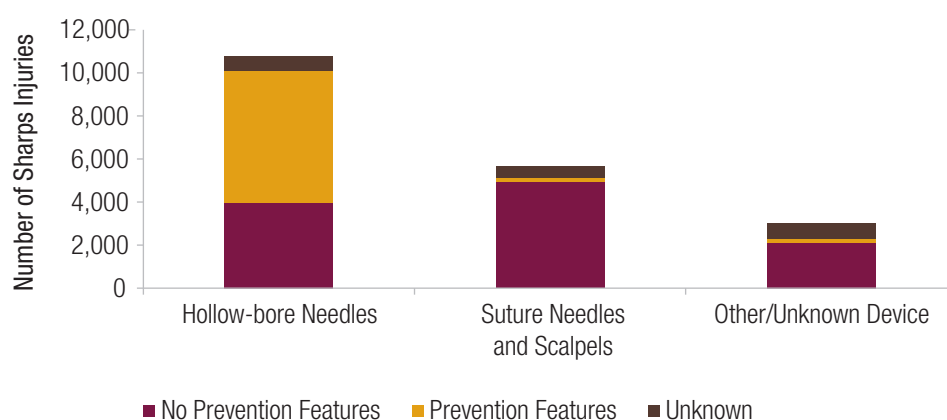
Source: MDPH Sharps Injury Surveillance System, 2002–2007.

\*Statistically significant decrease in rate over time ( $p < 0.05$ ).

Though data indicate an increased use of devices with sharps injury prevention features, there continue to be a substantial number of injuries with devices lacking such features, particularly with hollow bore hypodermic needles, for which alternatives are available (Figure 9.7).

Though fewer in number, injuries are also caused by devices with injury prevention features. This raises important questions about specific instruments used and staff training in the use of these newer devices.

Figure 9.7 Sharps Injuries among Hospital Workers by Device and Presence of Engineered Sharps Injury Prevention Features



Source: MDPH Sharps Injury Surveillance System, 2002–2007.

OHSP surveillance findings about patterns of sharps injuries provide a framework for hospitals to improve their prevention and evaluation efforts.<sup>6</sup> OHSP also provides technical assistance to hospitals to develop sharps injury prevention programs. These include strategies to increase the use of devices with sharps injury prevention features, training and recommendations for safer work practices, and improving post-exposure follow-up

of workers who have experienced a sharps injury. OHSP also facilitates exchange of this information among hospitals and hospital workers.

## According to recent findings

from the Massachusetts

BRFSS, 40% of adults

with asthma report that

their asthma was either

caused or made worse by

exposures at work.

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## Work-Related Lung Diseases

Breathing in dusts and fumes at work can damage the lungs, causing diseases such as silicosis, asbestosis, lung cancer, and “popcorn lung” caused by the chemicals used in flavorings. Workplace exposures can also cause asthma or aggravate asthma symptoms. According to recent findings from the Massachusetts BRFSS, 40% of adults with asthma report that their asthma was either caused or made worse by exposures at work.<sup>7</sup> (For more information on asthma, see Chapter 7).

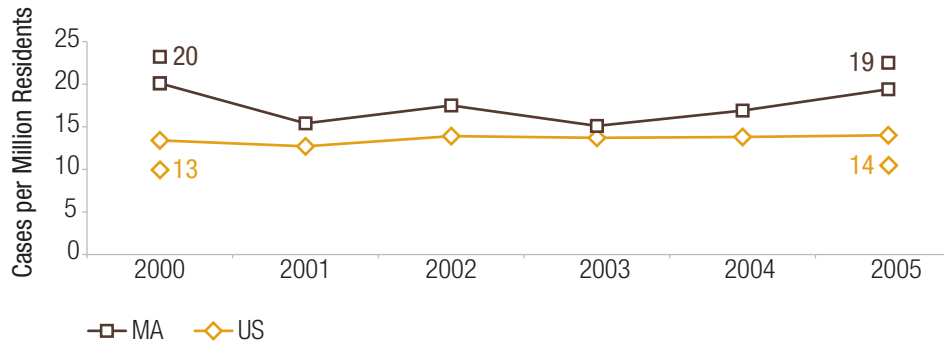
Work-related asthma is a reportable condition in Massachusetts, and OHSP tracks cases reported to MDPH by health care providers and hospitals.<sup>8</sup> These cases provide important information about industries and occupations where workers are at risk, as well as hazards that need to be corrected.

For example, individuals with work-related asthma interviewed by OHSP commonly report that their asthma symptoms are associated with the use of cleaning products. Other states have also identified a link between asthma and the use of cleaning products in the workplace.<sup>9,10</sup> OHSP has participated in national efforts to ensure that cleaning products certified as “green” do not include ingredients known to cause asthma. State and city agencies and schools are being encouraged to use these safer products. OHSP has also worked to reduce exposures to other substances known to cause asthma such as latex in gloves and isocyanates in auto body spray paint.

Pneumoconioses are a group of lung diseases caused by inhalation of mineral dusts (primarily silica and asbestos), nearly always in occupational settings where processes such as sandblasting, shipfitting, and asbestos remediation take place. In 2006, there were nearly 900 hospitalizations of individuals with pneumoconiosis. More than 90% of these were hospitalizations for asbestosis, a lung disease caused by exposure to asbestos. Asbestos is also the only well established risk factor for mesothelioma, a rare but highly fatal cancer of the lining of the lung and abdomen. During 2000–2005, an average of 94 cases of mesothelioma were reported to MDPH each year, and the rate of mesothelioma in Massachusetts consistently exceeded that for the nation (Figure 9.8).<sup>11</sup>

Because asbestosis and mesothelioma take many years to develop, cases diagnosed today are due to asbestos exposures in the past. High rates of mesothelioma and asbestosis in Massachusetts are in large part a legacy of our shipbuilding industry. Workers who were employed in construction and certain manufacturing industries, such as textile manufacturing, are also at risk. While use of asbestos has declined significantly in recent years, the Occupational Safety and Health Administration (OSHA) estimates

Figure 9.8 Incidence Rates of Malignant Mesothelioma



Sources: MDPH Cancer Registry, National Cancer Institute Surveillance Epidemiology and End Results (SEER) Program and the North American Association of Central Cancer Registries.

\* The MA rate was significantly higher than the US rate ( $p < 0.05$ ).

that 1.3 million workers in the US continue to be exposed to asbestos at work. A particular concern is exposure to in-place asbestos in buildings, including schools.<sup>12</sup>

Continued surveillance of mesothelioma is important not only to document the burden of disease and evaluate the impact of prevention efforts over time, but also to identify previously unrecognized settings in which workers and community members may be at risk. The continuing tragedy of asbestos-related disease is also an important reminder of the need for precautions in introducing new materials and chemicals into the workplace.

### Work-Related Injuries to Teens

Although teen employment has declined from its peak in 1999, young workers continue to be a vital part of the Massachusetts workforce. In 2007, an estimated 25% of 15-17 year-olds in Massachusetts were employed on average at any given time, largely in part-time jobs in retail and service industries.<sup>13</sup> While employment can provide many benefits for youth, working teens also face workplace health and safety risks.

Tragically, nine Massachusetts teens have been fatally injured at work since 2000. Nationally, young workers have higher rates of nonfatal occupational injury per hours worked than adults.<sup>14</sup> This is explained in part by the types of jobs they do; many jobs in which teens are employed have higher than average injury rates for workers of all ages. Other factors – inexperience, lack of safety training, and developmental factors, both physical and psychosocial – may also increase risks for young workers.<sup>15</sup>

When a MDPH study of childhood injuries in the late 1980s found that a substantial percentage of injuries to 14-17 year-olds were work-related, MDPH took action.<sup>16</sup> In 1993, public health regulations were passed

**While employment can provide many benefits for youth, working teens also face workplace health and safety risks.**



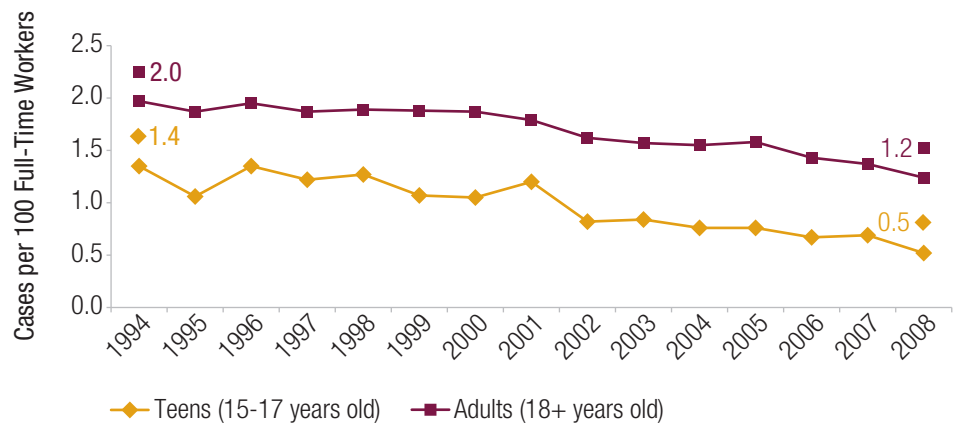
### Teens Killed Operating Forklifts

Since 2000, two teens have been fatally injured while operating forklifts, a task prohibited by child labor laws. In response, MDPH developed a bilingual forklift sticker. Hundreds of thousands of these warning labels have been disseminated nationally by MDPH and federal partners.

requiring hospitals to report work-related injuries to persons under age 18.<sup>8</sup> Since that time, OHSP has tracked work-related injuries to teens under age 18 using emergency department data and workers' compensation records to identify cases. OHSP conducts follow-up interviews with injured teens, and works with multiple government agencies and community partners to address identified health and safety problems and promote safe work for youths. Findings were used by community partners in advocating for changes to strengthen Massachusetts child labor laws, passed by the legislature in 2006.<sup>17</sup>

While there is evidence of success, more remains to be done. Between 1994 and 2008, the occupational injury rate for teens (based on workers' compensation lost wage claims) declined by 61% compared to a 37% decline in the rate for adult workers (Figure 9.9). However, each year close to 1,000 Massachusetts teens continue to seek emergency department treatment for work-related injuries and more than 250 workers' compensation claims are filed for injuries resulting in five or more lost workdays.

Figure 9.9 Rates of Nonfatal Work-Related Injuries to Teens and Adults



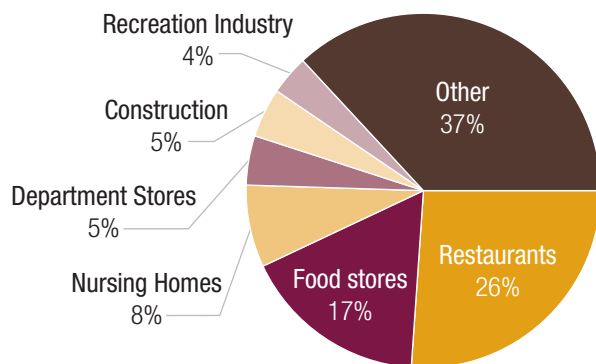
Source: Massachusetts Department of Industrial Accidents Workers' Compensation Claims, MDPH Teens at Work Injury Surveillance System.

\*Statistical significance for each trend line and between trend lines is  $p < 0.001$ .

Injuries occur most frequently among teens employed in restaurants, food stores and nursing homes (Figure 9.10). Interviews with injured teens highlight lack of health and safety training, inadequate supervision and lack of compliance with child labor laws as continuing problems that need to be addressed. Often injuries to teens are considered "not serious" but 18% of those interviewed anticipate long term consequences as a result of their injuries (Figure 9.11).

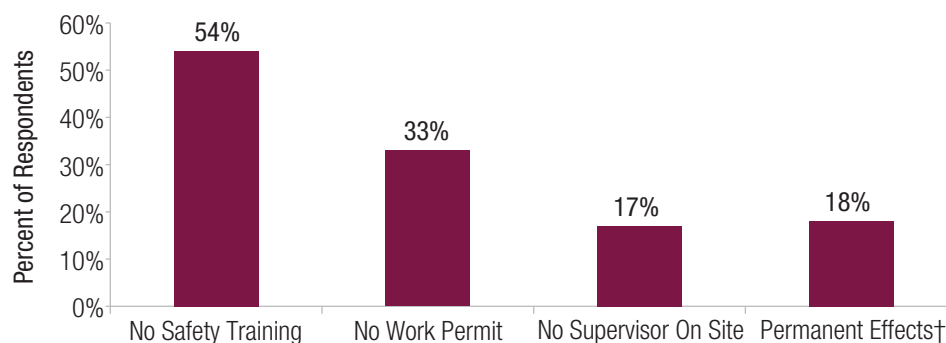
No agency in Massachusetts has the sole responsibility for protecting young workers. The Massachusetts Youth Employment Safety (YES) Team, under MDPH leadership, brings together state and federal agencies concerned with youth employment to coordinate efforts to protect

Figure 9.10 **Work-Related Injuries to Teens Under Age 18 by Industry Sector**



Source: Massachusetts Department of Industrial Accidents Workers' Compensation Claims, MDPH Teens at Work Injury Surveillance System, 2002-2007.

Figure 9.11 **Interviews with Massachusetts Teens Injured at Work**



Source: MDPH Teens at Work Injury Surveillance System, 2001-2005.

and promote the health and safety of young workers.<sup>18</sup> OHSP has collaborated with the Office of the Attorney General and the Department of Elementary and Secondary Education to produce and disseminate information about child labor laws and health and safety for teens, parents and employers. OHSP has helped develop and deliver three-hour basic health and safety training for working youths. MDPH has also provided support for a peer-run youth health and safety leadership academy for teens that focuses on workplace violence and other workplace health and safety issues, including how to speak up about safety concerns. New efforts are underway to integrate health and safety training in workforce development programs for youths.

## Occupational Health Disparities

As with most other health problems, the burden of work-related injuries and illnesses is not borne equally by all Massachusetts residents. Low-income, immigrant, and racial and ethnic minority workers are at higher risk. This is due in large part to the fact that they are more likely to be

### What Injured Teens Have to Say

"A co-worker and I were lifting a patient to help her sit up in bed. We were using proper body form, but there weren't enough people helping. I strained my back and fell. They said, "You're ok," and made me work the rest of the shift. I had been lifting the patient using a draw sheet. I pulled my lower back and strained my ligaments."

— 17-year-old nursing home employee

### Fatal Injuries among Brazilian Workers in Massachusetts

Brazilians are the most populous newcomer group in Massachusetts post 1990; almost one out of every five immigrants entering Massachusetts is from Brazil.<sup>19,20</sup> From 1991, when MDPH first began tracking fatal occupational injuries, through 1999, the death of one worker born in Brazil was recorded. From 2000-2007, 17 workers born in Brazil were fatally injured at work in Massachusetts. All were male and 12 worked in construction. Falls to lower levels accounted for six of the Brazilian construction worker deaths. Brazilians, who speak Portuguese, do not usually identify as Hispanic, and most deaths of Brazilian born-workers are not included in the Hispanic fatality count.<sup>21</sup>

employed in higher risk jobs (Figure 9.12). Discrimination and economic insecurity that make workers hesitant to speak up about workplace hazards may also contribute to these disparities.

Figure 9.12 **Leading Occupations in Massachusetts**

WHITE	BLACK
Secretaries	Nursing aides
Managers & admin.	Janitors & cleaners
Supervisors in retail sales	Registered nurses
Registered nurses	Cashiers
Salespersons	Maids

HISPANIC	ASIAN
Nursing aides	Computer engineers
Janitors & cleaners	Medical scientists
Grounds maintenance	Waiters & waitresses
Maids	Physicians
Truck drivers	Cashiers

Source: US Department of Labor, Bureau of Labor Statistics, Current Population Survey, 2005-2007.

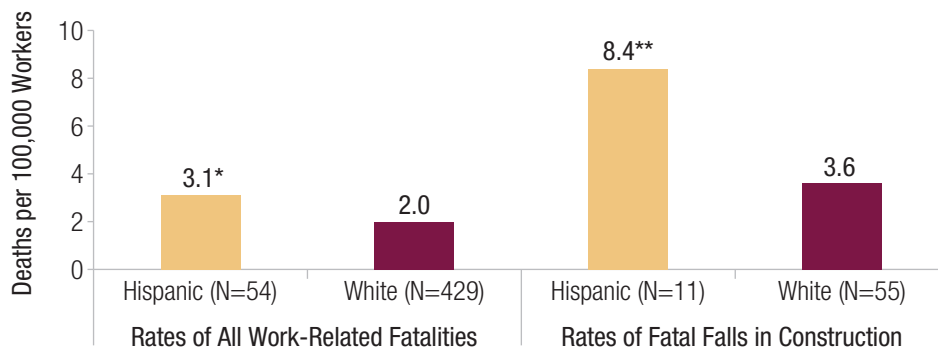
Traditional sources of information about work-related injuries and illnesses, the Survey of Occupational Injuries and Illnesses and workers' compensation records, do not include information about race and ethnicity or country of origin. They are also thought to miss many injuries affecting immigrants and other vulnerable workers. In response, OHSP has developed other approaches to document occupational health disparities.

Occupational fatality data collected by OHSP reveal that Hispanic workers in Massachusetts are more likely to be fatally injured at work than their White counterparts. During 2000-2007, Hispanic workers had a higher risk of being killed on the job (Figure 9.13). This disparity in rates was evident even *within a high risk* occupation: the rate of fatal falls among Hispanic construction workers was twice that for White workers.

Hospitalization data also reveal the disparate impact of work-related injuries on communities of color. During 1996-2000, Hispanic workers were at high risk of being hospitalized for work-related injuries – particularly burns and amputations – compared to White workers. Asian workers were at high risk of hospitalization for work-related burns. Black workers were at high risk of hospitalization for strains and sprains that occurred at work (Figure 9.14).<sup>22</sup> Even among working teens, Hispanic youth are more likely to sustain injuries treated in emergency departments than White teens who work (4.5 vs. 3.0 ED visits per 100 full time workers in 2003-05).<sup>23</sup>



Figure 9.13 **Fatal Occupational Injuries, Hispanic and White Workers**

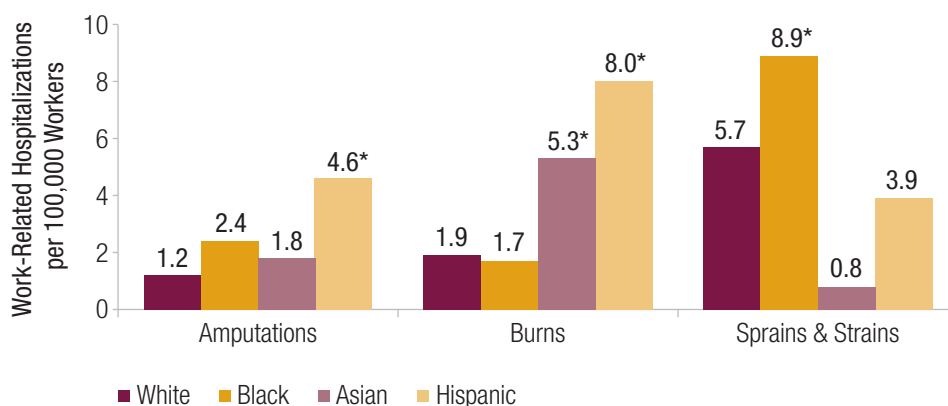


Source: MDPH Census of Fatal Occupational Injuries, 2000–2007.

\*Rate significantly higher than rate for Whites ( $p < 0.05$ ).

\*\*Rate borderline significantly higher than rate for Whites ( $p < 0.05$ ).

Figure 9.14 **Hospitalization Rates for Select Work-Related Injuries**



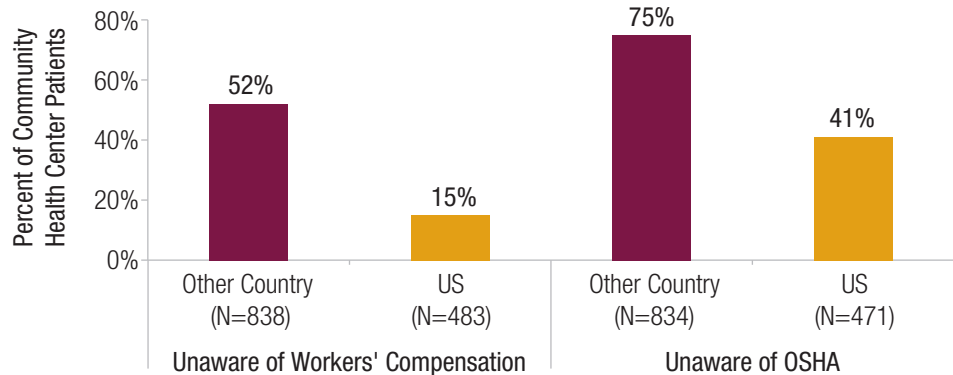
Source: Massachusetts Division of Health Care Policy and Finance, Hospital Discharge Database, 1996–2000.

\*Injury rate is significantly greater than rate for Whites ( $p < 0.05$ ).

Low-income, immigrant, and racial and ethnic minority workers are less likely to have access to health and safety resources. To learn more about the occupational health experience of these workers, OHSP conducted a survey of more than 1,400 patients at five community health centers. The survey was conducted in six different languages. More than 21% of those interviewed reported experiencing a work-related health problem during the previous year. Fifty-two percent of patients born in other countries had never heard of workers' compensation compared to 15% of those born in the US (Figure 9.15). A striking 75% of foreign-born patients had *never* heard of the US Occupational Safety and Health Administration (OSHA) compared to 41% of those born in the US.

The elimination of racial and ethnic health disparities is a public health priority both in Massachusetts and the nation. As surveillance findings indicate, working conditions contribute to these disparities. OHSP

Figure 9.15 **Patients Unaware of Workers' Compensation or OSHA, by Place of Origin**



Source: MDPH Occupational Health Survey of Massachusetts Community Health Centers, 2002–2003.

collaborates with a variety of community partners to translate data into action to address the occupational health needs of vulnerable workers and newcomer communities.

OHSP provides crucial data and technical assistance to a number of groups working to prevent hazards faced by vulnerable workers: the Massachusetts Floor Finishing Safety Task Force; the Lawrence Latino Safety Partnership, a community-university collaboration that develops methods to reduce falls and silica exposure among Latino construction workers; and the Access to Compensation Working Group that seeks to improve access to workers' compensation benefits for injured immigrant workers. OHSP has also helped facilitate safety training for Brazilian construction workers and outreach to Brazilian immigrants employed in the granite counter top industry.

In collaboration with these networks, OHSP has developed and translated user-friendly materials on fall prevention, fire prevention, and workers' compensation for the immigrant communities most affected. OHSP has also worked with the MDPH health communications office to develop and post Spanish and Portuguese podcasts on health and safety in construction. OHSP continues to work closely with several community health centers to increase identification and documentation of work-related injuries and illnesses affecting their patients, and to improve patients' access to occupational health services.

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### **Promoting and Protecting Employee Health**

The worksite is increasingly recognized as a setting for promoting healthy activities and behaviors. The MDPH Working on Wellness Initiative is helping employers to develop wellness programs that emphasize institutional changes that promote a culture of health (See Chapter 2 – Community Assets).

OHSP is collaborating with the Working on Wellness Initiative to encourage employers to address occupational health and safety risks in their worksite wellness programs.

Questions about occupational health policies and practices were included in the comprehensive Massachusetts Worksite Health Improvement Survey in 2008. Nearly 40% of the worksites that responded reported having a health and safety committee; however, more than 20% reported having neither a committee nor a designated individual responsible for worksite safety and health.<sup>24</sup> Both management leadership and worker involvement are considered crucial to developing safer worksites.<sup>25</sup> Steps taken by employers to create safer work environments can increase employees' participation in health promotion efforts.<sup>26</sup>

Academic partners at the University of Massachusetts Lowell and the Harvard School of Public Health are working with MDPH to develop integrated approaches to worksite wellness that both promote and protect worker health.

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## Summary

Work matters. It is necessary to consider the impact of work on health in the overall effort to protect the health of the public and reduce preventable human suffering and costs. Data to guide action and partnerships among public health programs and with community partners are essential to address the full range of health needs of an increasingly diverse and mobile workforce.<sup>27</sup>



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**W**e are fortunate in Massachusetts to have the Occupational Health Surveillance Program dedicated to measuring and interpreting essential information on occupational injury, disease and risks. The Program has been instrumental in gathering data and disseminating accessible and informative analyses that are well used by communities. Investigating the factors contributing to recent floor finishing fatalities, surveying injured teens to identify commonalities, and culling through thousands of injury and illness reports from public sector employees provide examples of what makes OHSP a key partner for communities seeking to ground their education and policy development efforts in real data.

Exciting opportunities exist now to build on this very strong foundation and fill important gaps in information that could greatly benefit workers across the entire range of employment in the Commonwealth from healthcare, education, construction and manufacturing to retail, and service.

First, we must continue including information about "work" when other health data are collected in Massachusetts, whether through vital statistics, surveys or electronic health records. Collection of data about individuals' workplaces and jobs can improve our understanding of the hazards workers face and, in turn, our ability to take action to reduce health and safety risks.

Second, we have to collaborate across the Department's programs to integrate occupational health with the day-to-day practice of public health. Some examples include influenza and the impact on health care workers, cardiovascular disease and the role of workplace stress, and the contribution of workplace factors to adult asthma.

Third, we need to work with the Commonwealth's economic growth leaders to anticipate and address potential risks associated with the

development and adoption of new technologies and materials and promote safe, healthful, environmentally conscious jobs. An example is the emerging field of nanotechnology. Because the health and environmental effects are not sufficiently understood, we have to assume that some nanomaterials have the potential to impact worker health. OHSP should collaborate with the Department of Workforce Development among others to identify where use or manufacture of nanomaterials occurs, track the health of that workforce, and provide the new entities with the latest health and safety research on nanotechnology.

Fourth, we need to strengthen and build upon the Department's partnerships with community groups representing high risk groups such as teens and immigrants to engage them actively in identifying priority community needs and collaborating on data collection and dissemination strategies.

Fifth, we must utilize OHSP's expertise in implementing the data collection and analysis component of the Governor's new executive order establishing health and safety committees across state agencies.

Finally, we must consider the full breadth of the workforce. Rapid change in the nature and stability of jobs, the growth of the service and information economy, the need to improve health and safety protections for public sector workers, the aging worker demographic, and the growing ethnic and cultural richness and diversity of the workforce, are all key developments for the protection of worker health.



# FIGURE NOTES

- Figure 9.1:** Information about industry was unavailable for 1 occupational fatality. The Government sector includes occupational fatalities sustained by public sector workers regardless of industry. Data not presented for two industry sectors with fewer than 5 fatalities (Mining and Information). Rates calculated using MA employment estimates from the Current Population Survey, Bureau of Labor Statistics, US Dept. of Labor.
- Figure 9.2:** Not included in the figure were event/exposure sub-categories with <3 fatal injuries, and 1 fatality resulting from a bodily motion.
- Figure 9.3:** Only private sector employers were sampled. In 2003, the survey was not conducted in Massachusetts (data missing).
- Figure 9.4:** Only private sector employers were sampled.
- Figure 9.5:** N=19,485.
- Figure 9.6:** The number of sharps injuries from devices with unknown sharps injury protection features, which comprised <14% each year, are included in the calculation of rates but not included in the figure (annual counts).
- Figure 9.7:** Hollow-bore needles include but are not limited to hypodermic needles/syringes, winged steel needles, vacuum tube collections holder/needle, and IV stylets.
- Figure 9.8:** US rate for 2000-01 estimated from 13 Surveillance Epidemiology and End Results (SEER) Program cancer registries. US rate for 2002-05 estimated from 42 North American Association of Central Cancer Registries. Rates age-adjusted to the 2000 standard population.
- Figure 9.9:** Rates calculated using MA employment estimates from the Current Population Survey, Bureau of Labor Statistics, US Dept. of Labor.
- Figure 9.10:** Industry coded using the North American Industry Classification System, 1997. N=1,252.
- Figure 9.11:** Permanent effects include anticipated permanent pain, limited sensation or loss of movement. N=174.
- Figure 9.13:** Rates calculated using MA employment estimates from the Current Population Survey, Bureau of Labor Statistics, US Dept. of Labor.
- Figure 9.14:** Primary payer of workers' compensation used to identify work-related injuries.



**Figure 9.15:** The federal Occupational Safety and Health Act (legislation which created OSHA) and state Workers' Compensation law provide important rights, benefits, and protections to workers.

# ENDNOTES

- 1 The work of the Occupational Health Surveillance Program is funded largely through Cooperative Agreements with the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH). Some funding is also provided by the US Department of Labor, Bureau of Labor Statistics. OHSP surveillance reports and educational materials can be found on the OHSP website: [www.mass.gov/dph/ohsp](http://www.mass.gov/dph/ohsp).
- 2 MDPH, Occupational Health Surveillance Program. Fatal Occupational Injuries in Massachusetts, 2000-2007. 2008. Available at: [http://www.mass.gov/Eeohhs2/docs/dph/occupational\\_health/fatalities\\_2000\\_07.pdf](http://www.mass.gov/Eeohhs2/docs/dph/occupational_health/fatalities_2000_07.pdf).
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- 12 US Department of Labor, Occupational Safety and Health Administration. Safety and Health Topics: Asbestos. Available at: <http://www.osha.gov/SLTC/asbestos/index.html> Accessed September 14, 2009.
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*the Art Reviews: Special Populations*. Philadelphia, PA: Hanley and Belfus, Inc. 1999;14:519-536.

- 16 Brooks DR, Davis LK. Work-related injuries to Massachusetts teens, 1987-1990. *Am J Ind Med*. 1996;29:153-160.
- 17 General Laws of Massachusetts, Labor and Industries, Work by Women and Children. Chapter 149 Sections 56-105 (child labor laws).
- 18 See the OHSP January 2009 *Teens at Work* surveillance update for a description of the Massachusetts Youth Employment Safety Team available at [http://www.mass.gov/Eeohhs2/docs/dph/occupational\\_health/teen\\_surveillance\\_update\\_09.pdf](http://www.mass.gov/Eeohhs2/docs/dph/occupational_health/teen_surveillance_update_09.pdf).
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- 22 MDPH, Occupational Health Surveillance Program. Inpatient Hospitalizations for Work-Related Injuries and Illnesses in Massachusetts, 1996-2000. 2005. Available at: [http://www.mass.gov/Eeohhs2/docs/dph/occupational\\_health/hospitalization\\_report\\_05.pdf](http://www.mass.gov/Eeohhs2/docs/dph/occupational_health/hospitalization_report_05.pdf).
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# Alcohol, Tobacco, and Other Drug Use



Addiction is a chronic, relapsing disease. Left untreated, its consequences create a significant public health burden. Its physical and mental health effects range from illness and disability to death. It causes traffic accidents, crime, job loss, homelessness, unplanned pregnancies, domestic violence, child abuse and neglect, and more. Most aspects of our society, and every aspect of our social service and criminal justice systems, bear a significant impact from substance use disorders. The impact on all our systems is extraordinary - from the court system to corrections, emergency rooms to homeless shelters, and from police officers to school teachers, and employers.

Left untreated, SUDs impose significant costs on the Commonwealth, especially upon those who rely upon programs and services of multiple state agencies. Massachusetts bears a greater public health burden from substance use disorders than that of many other states, however substantial work has been done in recent years to decrease this gap.

Alcohol affects most organ systems, and many drugs affect the nervous system and the heart. Unhealthy use can complicate other chronic

Substance use disorders lead to a wide variety of long term disabling diseases such as cirrhosis of the liver, cancer, cardiovascular diseases, cerebral atrophy, and fetal alcohol syndrome, and to an increased incidence of HIV/AIDS and antibiotic-resistant tuberculosis. In society as a whole, substance use disorders also adversely affect family members, ...job and school performance, and are associated with crime, violence and accidents.”<sup>1</sup>

**Substance Use Disorder (SUD)** is a combination of dependence and abuse. Generally known as addiction, or abuse, substance use disorders are chronic medical conditions that professionals can diagnose when a person’s drinking or drug use causes distress or harm.



illnesses such as diabetes, high blood pressure, cardiovascular diseases and depression. Misuse can also counteract medications or make them less effective, can cause ulcers, disrupt sleep, present memory problems and increase anxiety. Alcohol use, even at what might be considered low-risk levels, is counter indicated when used with specific medications, with a diagnosed Substance Use Disorder, when operating machinery, or with certain health conditions.

Health and life consequences can occur even with substance use that may be considered low risk. How often, how much, and under what circumstances can determine if the use is problematic.

Problem and pathological gambling is a behavior of great concern to public health. An estimated 250,000 adults have had gambling problems in the last year.<sup>2</sup> Youth and young adults, the elderly, specific racial and ethnic groups and those with lower incomes appear to be particularly vulnerable and have higher prevalence rates of problem gambling. The Department of Public Health supports a variety of prevention and treatment program to address problem gambling in the Commonwealth.

The use patterns and effects of alcohol, tobacco, and other drugs, can be viewed based on a person's developmental stages. Alcohol use during pregnancy can damage a developing fetus. In fact, there are no known safe levels of alcohol use during pregnancy so pregnant women or women who may become pregnant should not drink from conception to birth.

The effects of even a small amount of alcohol or drugs on children under 18 years of age, when their bodies and brains are still developing, are different from the effects those substances have on adults. During the transitional ages of 18-25 years, the use of alcohol, tobacco and/or other drugs may have different long-term effects than on older adults.

For adults with certain medical problems or medications, alcohol or drug use can have serious health consequences. The impact of alcohol use while taking medications increases as adults enter their sixties and beyond. Because of changes to their metabolism, seniors cannot consume the same amount of alcohol that they could have when they were younger. In addition to biological effects, over-consumption can lead to serious falls or other accidents requiring urgent care.

Research has demonstrated that screening for alcohol, tobacco and other drug use (ATOD) in health care settings along with a brief intervention when risky use is detected help reduce harmful levels of ATOD use.<sup>3</sup> The Substance Abuse and Mental Health Services Administration (SAMHSA) as well as Massachusetts and many other states support the use of Screening, Brief Intervention, and Referral to Treatment (SBIRT) in primary care, emergency room and other health care settings to encourage patients to cut back use where appropriate.



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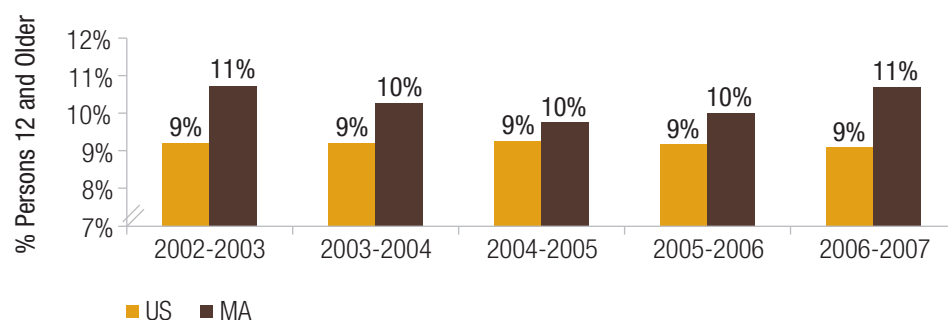
## Dependence and Abuse

Those who are dependent on alcohol or drugs have developed a tolerance for these substances and experience mental and physical withdrawal if they try to stop using them. Dependent substance users spend large amounts of their time and resources purchasing and consuming alcohol or drugs, and continue using despite significant adverse consequences.

National surveys suggest that just over nine percent (9%) of the nation's population currently abuse or are dependent on alcohol and/or illicit drugs (Figure 10.1). Illicit drugs include marijuana, cocaine, heroin, hallucinogens, inhalants, and the non-medical use of prescription-type psychotherapeutic drugs. This percentage has remained constant on the national level during the period of 2002 through 2007. In Massachusetts, the proportion of the population with a substance use disorder is consistently higher and remains steady at approximately ten percent (10%).

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Figure 10.1 **Abuse of Illicit Drugs or Alcohol, MA and US**



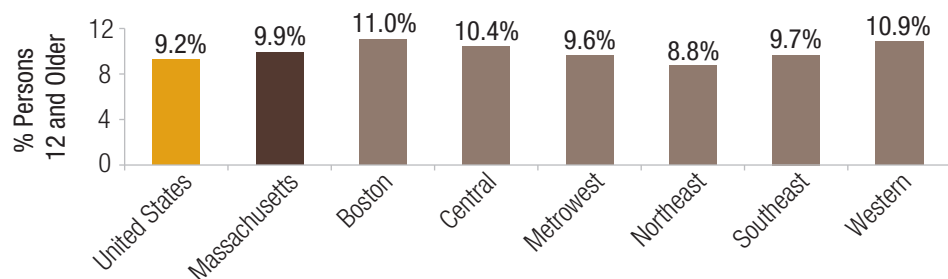
Source: SAMHSA, National Survey on Drug Use and Health, 2004-2006.

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Within Massachusetts there are regional variations in the rates of those currently misusing or dependent on alcohol and/or one or more drugs (Figure 10.2). The problem is most severe in the Greater Boston area, and almost as severe in the less urban western and central regions of the state.

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Figure 10.2 **Abuse of Illicit Drugs or Alcohol by Region**



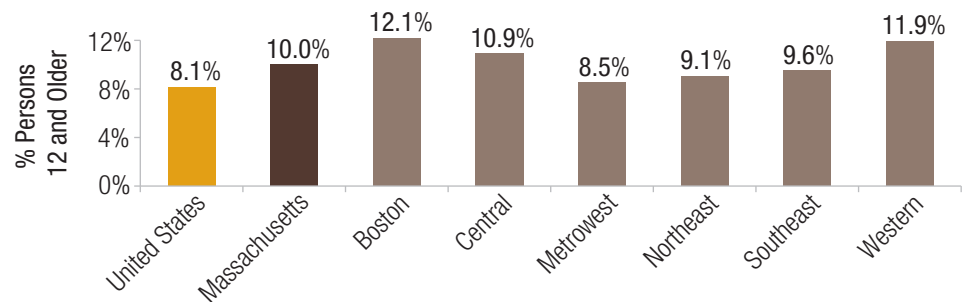
Source: SAMHSA, National Survey on Drug Use and Health, 2004-2006.

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This pattern – higher prevalence of substance use disorders in both the most urban and the most rural areas – has been observed in most other states, and is not unique to Massachusetts.

The use of illicit drugs within the past month has the same regional variation as that of combined illicit drug/alcohol use but is more pronounced (Figure 10.3). As with overall dependence/abuse of illicit drugs/alcohol in the last year, there is a higher prevalence of SUDs in urban and most rural areas of the state.

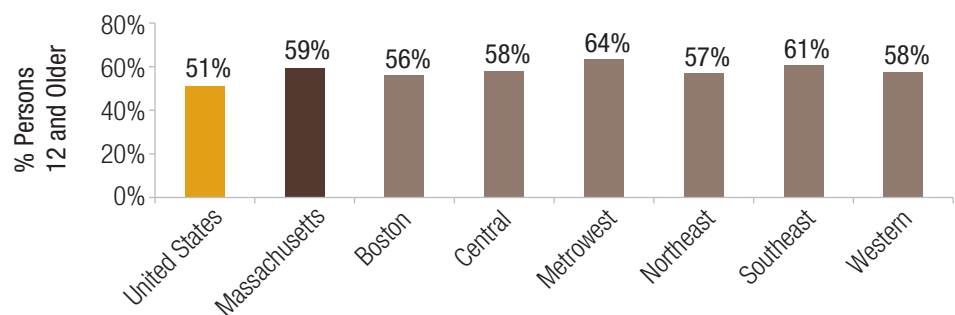
Figure 10.3 **Illicit Drug Use, Past Month by Region**



Source: SAMHSA, National Survey on Drug Use and Health, 2004-2006.

Within Massachusetts there is some variation in the rates of those using alcohol in the past month (Figure 10.4). In contrast to illicit drug use, the Metro West region is slightly higher than all other regions.

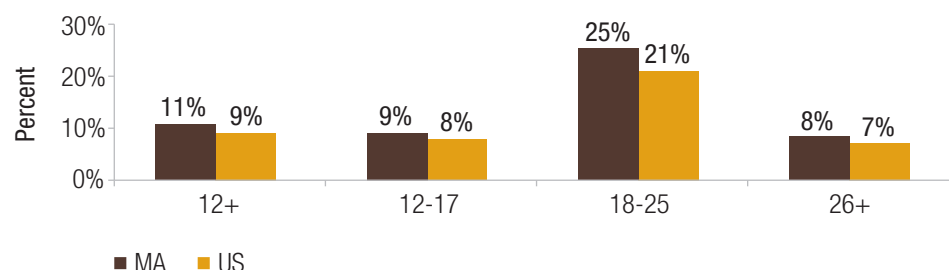
Figure 10.4 **Alcohol Use, Past Month by Region**



Source: SAMHSA, National Survey on Drug Use and Health, 2004-2006.

Rates of dependence and abuse can vary by age as well (Figure 10.5). Overall, Massachusetts residents in every age group experience higher rates of dependence and abuse than national averages. In Massachusetts this difference is most pronounced among the 18-25 year-old age group, with state rates approximately 20% higher than national rates. In Massachusetts and the US, alcohol and drug use peak in this young adult population.

Figure 10.5 Abuse of Illicit Drugs or Alcohol, Past Year by Age



Source: SAMHSA, National Survey on Drug Use and Health, 2004-2006.

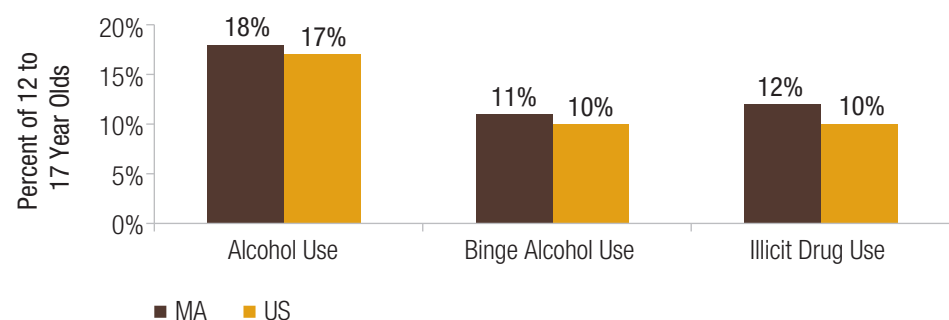
## Substance Use Among Youth

While most young people reported to the National Survey on Drug Use and Health (NSDUH) that they had not had anything to drink in the last month, alcohol is the most commonly used and abused drug among youth in the United States, more than tobacco and illicit drugs.

Although drinking by persons under the age of 21 is illegal, people aged 12 to 20 years drink 11% of all alcohol consumed in the United States. More than 90% of this alcohol is consumed in the form of binge drinking (five or more drinks at one time). On average, underage drinkers consume more drinks per drinking occasion than adult drinkers. In 2005, there were more than 145,000 emergency room visits by youth 12 to 20 years for injuries and other conditions linked to alcohol.<sup>4</sup>

The prevalence rates of alcohol use, binge drinking and illicit drug use are all higher in Massachusetts than nationally (Figure 10.6). In Massachusetts, 18% of youths use alcohol and 11% binge drink compared to 17% and 10% nationally. Illicit drug use at 12% is 20% higher than the national prevalence rate. To put this in context, with approximately 520,000 12 to

Figure 10.6 Youth Substance Use, MA and US



Source: SAMHSA, National Survey on Drug Use and Health, 2006-2007.

17 year-olds in the State, the two percentage point difference in illicit drug represents about 10,000 youths.

Until relatively recently, it was believed that the human brain was fully developed by the early teens. Over the last 10 years, it has become clear that not only does the brain continue to develop into the early twenties, but areas of the brain controlling impulse control and judgment are among the last areas of the brain to mature. According to the National Institute on Alcohol Abuse and Alcoholism, use of alcohol during the teens and early twenties can have a very negative impact on the brain, possibly delaying, damaging or preventing the maturation process.

Research has linked adolescent alcohol and drug consumption to a host of consequences, including poor school performance and an increased risk of addiction during adulthood. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) reports that children who began drinking before the age of 15 are four times more likely to become dependent on alcohol at some point in their lives.

**Massachusetts funds 31 substance abuse prevention programs, which have a particular focus on underage drinking. By changing and enforcing policies that limit access to alcohol, the likelihood of underage drinking is significantly decreased.**

Over the past year, Massachusetts has funded 31 substance abuse prevention programs, which have a particular focus on underage drinking. All 31 programs are implementing strategies, including compliance checks, social host liability and server training designed to limit access to alcohol for those under twenty-one. By changing and enforcing policies that limit access to alcohol, the likelihood of underage drinking is significantly decreased.

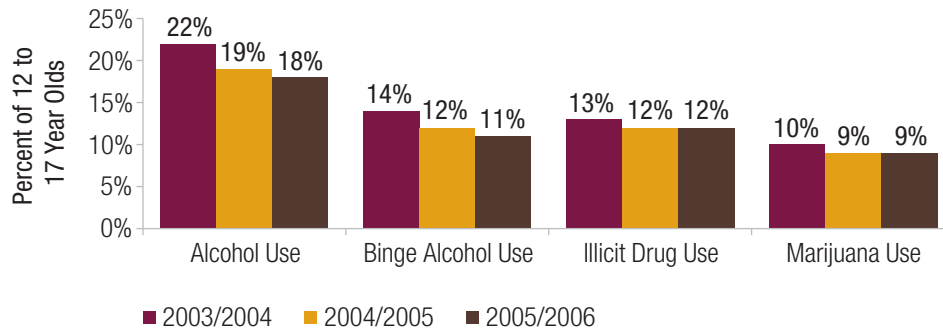
A prime example of policy change is the recent law removing the sales tax exemption for alcohol sold for off-site consumption. Over 112 studies indicate that by raising taxes on alcohol, consumption is reduced, *particularly in the underage population*. These program and policy changes not only highlight successful approaches to prevention in the Commonwealth, but also support the belief that in order to be effective, substance abuse prevention must be ongoing, enhanced and continuous over time.<sup>5</sup>

Along with these programmatic and policy change efforts, binge drinking, illicit drug and marijuana use all decreased from 2003 thru 2006 (Figure 10.7). Of note, alcohol use is down 18% from 22% to 18% of youths using and binge drinking is down 21% to 11%. Illicit drug use is down by almost 8% to 12% and marijuana use by 10% to 9%.

Massachusetts youth are waiting longer to drink and use marijuana than they did several years ago, but the average age when they begin using is still only around 14 years old (Figure 10.8).

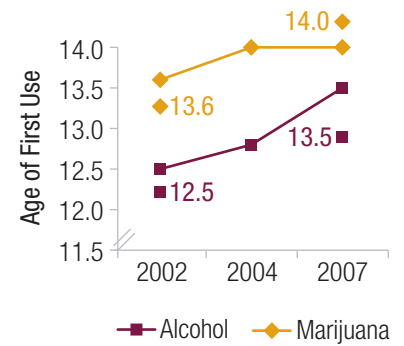
Youth reporting using alcohol in the past month have decreased over time for both middle and high school students (Figure 10.9). High school use has dropped from 53% in 2001 to 46% in 2007. Middle school use has dropped by more than 50% from 23% in 2002/2003 to 11% in 2007.

Figure 10.7 **Youth Substance Use, 2003-2006**



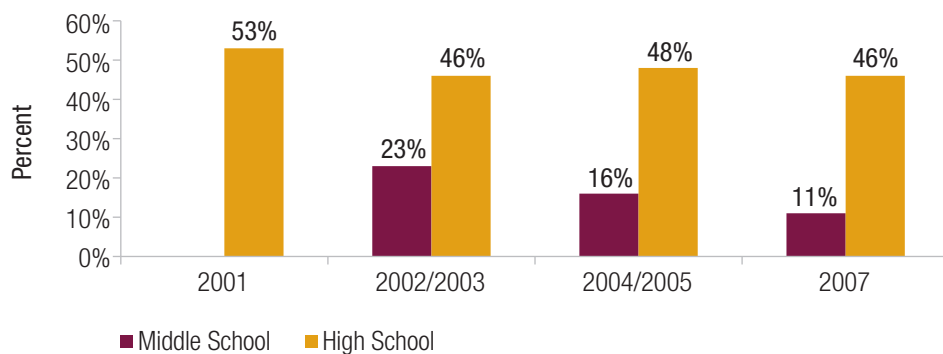
Source: SAMHSA, National Survey on Drug Use and Health, 2003-2006.

Figure 10.8 **Age of First Use, Middle & High School Students Combined**



Source: MDPH Youth Health Survey, 2007.

Figure 10.09 **Youth Alcohol Use, Past Month**



Source: MDPH Youth Health Survey, 2007; Massachusetts Department of Elementary and Secondary Education Youth Risk Behavior Survey, 2007.

Marijuana use in high school has decreased from 27.7% in 2003 to 24.6% in 2007 (Figure 10.10b). Middle school use has also declined from 7.6% in 2002 to 5.1% in 2007.

Figure 10.10a **Youth Marijuana Use, Past Month, Middle School**

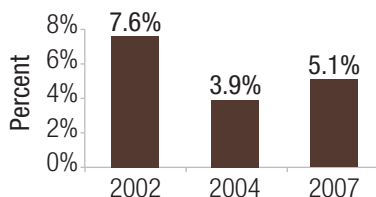
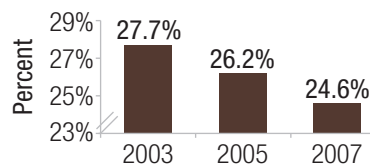


Figure 10.10b **Youth Marijuana Use, Past Month, High School**



Source: MDPH Youth Health Survey, 2007; Massachusetts Department of Elementary and Secondary Education Youth Risk Behavior Survey, 2007.

The prevalence of binge drinking in high school has remained relatively constant at about 27% (Figure 10.11b) while binge drinking has decreased by more than 50% in middle-schoolers from 8.8% in 2002 to 4.2% in 2007.

Figure 10.11a **Youth Binge Drinking, Past Month, Middle School**

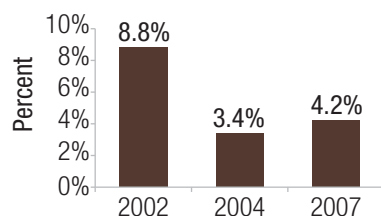
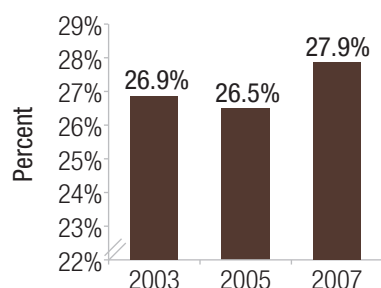


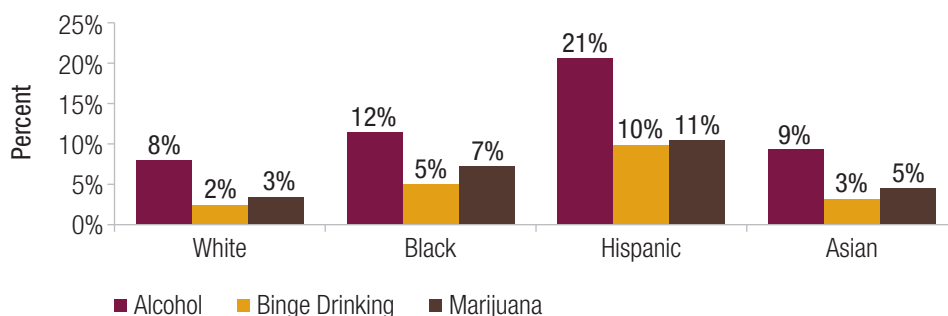
Figure 10.11b **Youth Binge Drinking, Past Month, High School**



Source: MDPH Youth Health Survey, 2007; Massachusetts Department of Elementary and Secondary Education Youth Risk Behavior Survey, 2007.

There is considerable variation in the prevalence of youth substance use between race and ethnic groups (Figure 10.12). Hispanics have roughly twice the prevalence of alcohol use (20.6%) as Blacks (11.5%) followed by Asians (9.3%) and Whites (8%). Binge drinking and marijuana have similar variation in use patterns.

Figure 10.12 **Youth Substance Use**



Source: MDPH Youth Health Survey, 2007.

## Substance Use Among Young Adults (18-25)

The developmental stage and characteristics of the 18-25 year-old age group are affected in a number of significant ways by alcohol and other drug use and abuse. During “young adulthood”, or “emerging adulthood,” (a more recent designation), continued exploration of identity is a focus. Substance abuse during this period can delay the individuation process on both a psychological and social level.

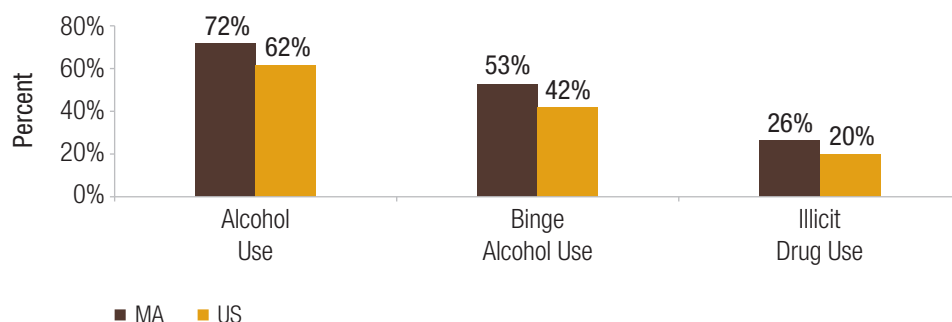
Factors that affect rates of young adult substance use include education, employment, and marital status. Other factors include living arrangements/ homelessness, incarceration, pregnancy, and parenthood. In 2006 nationally, the number of 18-25 year-olds reporting illicit drug use in the past month who graduated from high school was 35%, compared to 10% for those completing college. In addition, 10% of 18-25 year-olds employed full-time reported illicit drug use in the past month, compared to 47% of those who were unemployed.<sup>6</sup>

Drinking, heavy drinking, binge drinking, and engaging in other risky behaviors while drinking all steadily increase as adolescents age toward adulthood, and peak in the young adult years. Of particular concern is the dramatic increase in the misuse of prescription pain medication in recent years. Nationally there has been a 30% increase in teens who have tried OxyContin® with 1 in 10 high school seniors reporting they have tried Vicodin (2008). With 18-25 year olds there has been an increase from 5.4% in 2002 to 6.3% in 2005.<sup>7</sup>



The prevalence rates of alcohol use, binge drinking, and illicit drug are considerably higher in Massachusetts than nationally (Figure 10.13). Alcohol use at 72% is 17% higher than the national average. Fifty-three percent reported binge drinking versus 42% nationally and 26% reported illicit drug use which is 34% higher than the national average.

Figure 10.13 **Substance Use, Adults 18-25**



Source: SAMHSA, National Survey on Drug Use and Health, 2006-2007.

### Substance Use Among Adults

Among persons 26 years of age or older, Massachusetts ranks among the top ten states in the 2007 National Survey on Drug Use and Health (NSDUH) in the following categories:

- Marijuana use in the past year
- Cocaine use in the past year
- Alcohol use in the past month
- Alcohol dependence or abuse in the past year
- Dependence on or abuse of illicit drugs or alcohol in the past year
- Needing but not receiving treatment for alcohol use in the past year

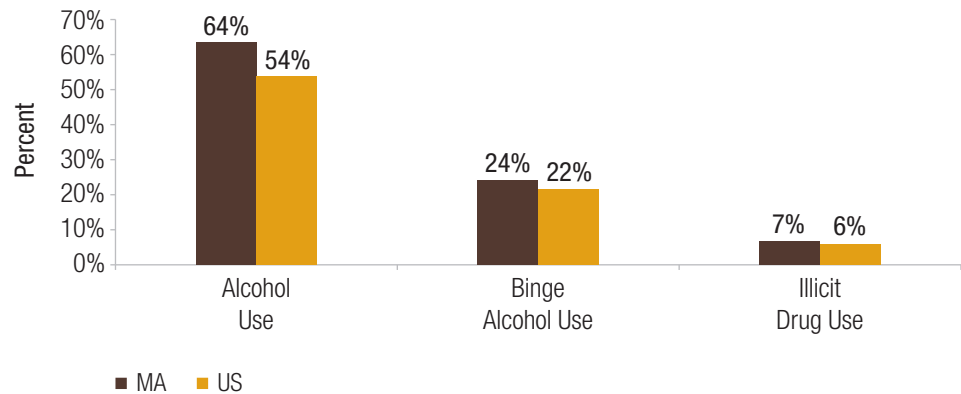
According to data from the survey, illicit drug use among older adults has increased since the beginning of this decade.

As with youth and young adults, the prevalence of adult alcohol use, binge drinking and illicit drug use are higher than national averages (Figure 10.14). Alcohol use at 64% is 18% higher while binge drinking and illicit drug use is 11% and 14% higher. At-risk drinking (consuming two or more drinks per day) is a problem as well with 17% of men and 11% of women ages 50 and older reporting such activity in the previous month.

The percentage of adults ages 50 to 59 in the US who reported using at least one illicit drug in the past year jumped from 5.1% in 2002 to 9.4% in 2007. In addition to alcohol and illicit drug use, the use of non-medical pain relievers has become a significant issue with steadily increasing incidence of deaths and emergency visits related to opioid use. In Massachusetts, the percentage

of adults using non-medical pain relievers is 4% which is 9.5% higher than the national average. Incidences of deaths and emergency room visits related to opioid use have been increasing steadily in recent years as well.

Figure 10.14 **Substance Use, Adults 26+**



Source: SAMHSA, National Survey on Drug Use and Health, 2006-2007.

Population projections suggest a steady increase in adults over the age of 26 in the next 50 years. It can be anticipated that the need for treatment and prevention efforts targeting this group will grow as well.

## Treatment Need

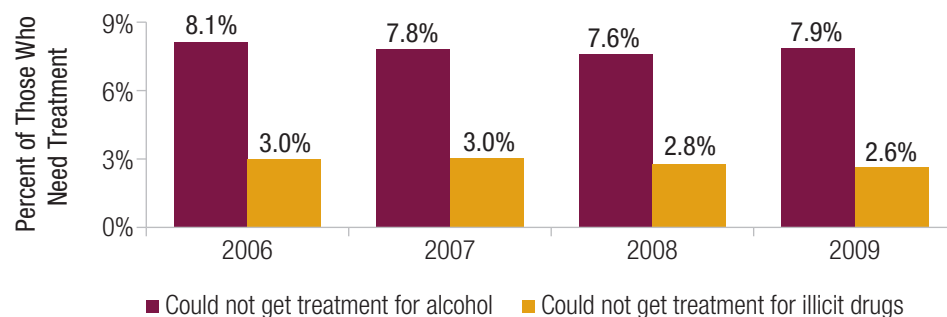
Based on SAMHSA's definition, any individual who meets the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for dependence or abuse of drugs or alcohol in the past year, or who has received substance abuse treatment in the past year is in need of treatment services. "Met need" is determined using the states administrative treatment data, while the estimates of unmet need are generally based on population based survey data.

The Department of Public Health funded 106,000 treatment admissions for roughly 58,000 people last year, but the need far outweighs the demand. According to NSDUH/SAMSHA in-person interviews, *most people in need of treatment do not seek it*. In 2007, of the 20.8 million people nationwide that needed treatment for illicit drug or alcohol use, 93.6% did not feel they needed treatment; 4.6% felt they needed treatment but did not make an effort to obtain it, and only 1.8% felt they needed treatment and made an effort to get treatment.

**The rates for unmet drug treatment need for those aged 18-25 have consistently been among the highest in the country.**

In Massachusetts, the rates of unmet alcohol and/or drug treatment need have been above the national rates for all age groups across all survey years (Figure 10.15). The rates for unmet drug treatment need for those aged 18-25 have consistently been among the highest in the country.

Figure 10.15 People Who Could Not Get Into Treatment, Ages 12+

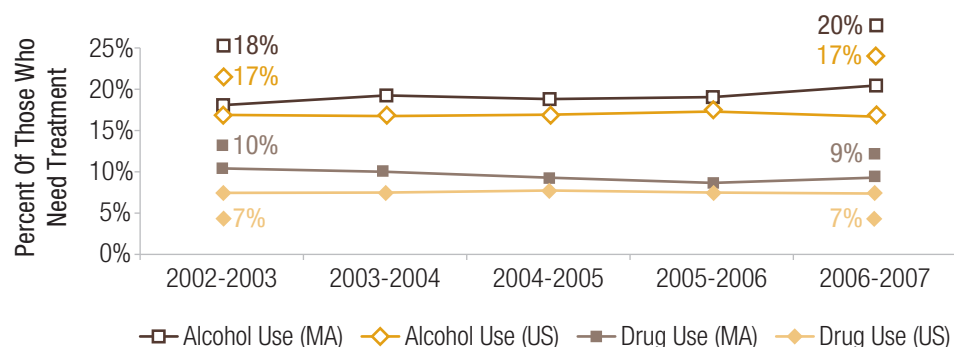


Source: Substance Abuse and Mental Health Services Administration Center for Substance Abuse Treatment (CSAT) State Snapshot, 2009.

Geographically in Massachusetts, the proportions of those people in need of, but not receiving, treatment range from a low of 6.8% in the Northeast to a high of 8.8% in Boston.

The highest levels of those needing but not receiving treatment occur among the young adult (18-25 year old) population. Again, Massachusetts rates are higher than the US averages for this age group (Figure 10.16).

Figure 10.16 People Who Could Not Get Into Treatment, Ages 18-25



Source: SAMHSA, National Survey on Drug Use and Health, 2002-2007.

## Opioid Related Morbidity and Mortality

Opioids include heroin, morphine, codeine, and other drugs commonly used for severe pain relief, including Oxycodone (OxyContin® and Percocet®) and hydrocodone (Vicodin®). Opioids have long been used to treat acute pain, such as post-operative pain. They are also used in palliative care to alleviate the severe chronic pain of terminal conditions such as cancer.

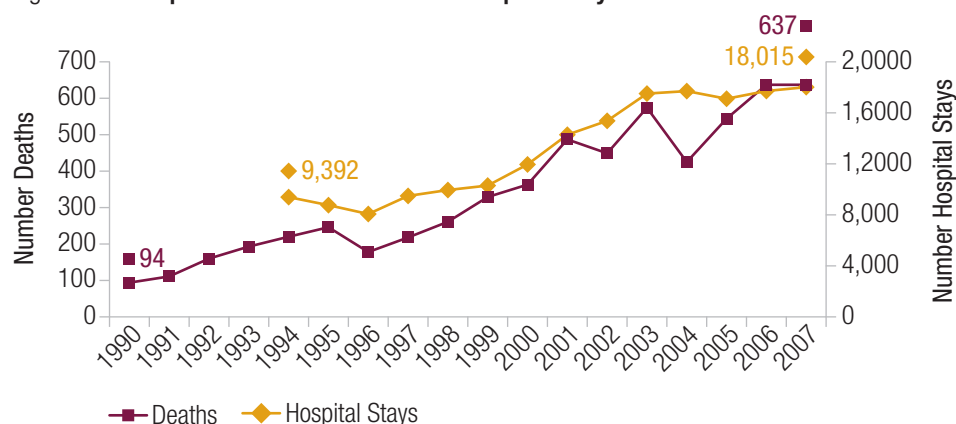
Opioids bind to specific opioid receptors in the central nervous system and other tissues, and have some of the greatest potential for dependence of any

**While heroin prices have remained low, purity levels have begun to fluctuate with both extremely high and low purity levels at the street level.**

category of drugs. Opioids are addictive. Withdrawal symptoms include severe dysphoria, sweating, muscle aches, goose flesh, vomiting and pain.

Since the late 1990s, the availability and purity of heroin in the Northeast United States as well as the increased availability and abuse of prescription painkillers has led to serious increase in the incidence of fatal and non-fatal overdoses from opioids (Figure 10.17).

Figure 10.17 Opioid-Related Deaths and Hospital Stays



Source: MDPH Death file, 1990-2007; Massachusetts Division of Health Care Finance and Policy Inpatient Hospital Discharge Database and Outpatient Observation Stay Database, 1994-2007. Note: Trends for deaths and hospital stays for dependence abuse or overdose are significantly increasing for period shown ( $p \leq .05$ ).

According to a recent National Drug Intelligence Center Drug Threat Assessment, heroin is the primary drug threat in Massachusetts. Nationally, heroin ranks fourth, after methamphetamine, cocaine and marijuana. Bureau of Substance Abuse Services treatment admission data have shown that heroin is the illicit drug that is most often the reason that people seek treatment.

In the past decade, the number of prescriptions for Schedule II opioid painkillers has doubled in Massachusetts. Although it is important to properly treat pain, the availability of these prescription drugs in the community can be a risk. The NSDUH has shown that “new initiates” to drug use are now more likely to use pain killers than to use marijuana. Often people who develop tolerance to prescription pain killers switch to heroin due to the lower cost and broad availability. These new prescribing patterns and drug use patterns have influenced the increase in opioid-related overdoses.

In addition to increase in availability of heroin, current investigations by the National Drug Intelligence Center indicate that diversion of pharmaceutical drugs, particularly Oxycodone products such as OxyContin®, continues to be a problem in Massachusetts. According to the 2007 National Survey on Drug Use and Health, the most common way that

people get prescription pain medication for non-medical use is from family and friends who have a legal prescription.

Massachusetts has seen an almost 20% increase of non-fatal overdose emergency department visits from 9,899 in 2002 to 11,777 in 2007. For every opioid-related fatal overdose in 2007, there were 47 nonfatal incidents treated at Massachusetts acute care hospitals.

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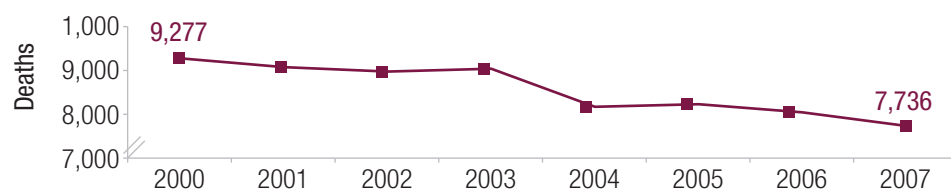
## Tobacco Use

### Health and Economic Costs

Tobacco use is the leading cause of preventable death and disease in Massachusetts. Approximately 7,800 Massachusetts residents die each year from tobacco-related causes (Figure 10.18), including cancers of the lung, larynx, throat, esophagus and mouth; heart disease and stroke; and emphysema and other respiratory diseases. Though smoking-attributable deaths in Massachusetts have decreased at the rate of 2.6% annually since 2000<sup>8</sup>, tobacco kills more people in Massachusetts than motor vehicle crashes, AIDS, homicides, suicides and poisonings combined.

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Figure 10.18 Deaths from Smoking



Source: MDPH Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC), 2006.

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Tobacco imposes a heavy financial burden on the Commonwealth, costing Massachusetts an estimated \$6.0 billion annually - \$4.3 billion in excess health care costs and \$1.7 billion in lost productivity (Figure 10.19).

### Adult Tobacco Use

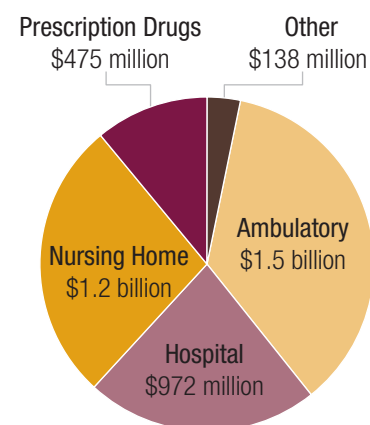
Thanks to aggressive public education campaigns, policy initiatives and targeted regulatory changes, far fewer adults smoke today than they did twenty years ago. The percentage of adult cigarette smokers in Massachusetts has declined at a rate of 2.2% annually, from 21.1% in 1993 to 16.1% in 2008. This represents a reduction of more 200,000 smokers (Figure 10.20). Currently, approximately 800,000 Massachusetts adults smoke.<sup>9</sup>

Based on 2008 data, 17% of men smoke and 15% of women smoke. The smoking rate by race/ethnicity is 16% for whites, 19% for blacks, and 15%

Thanks to aggressive public education campaigns, policy initiatives and targeted regulatory changes, far fewer adults smoke today than they did twenty years ago.

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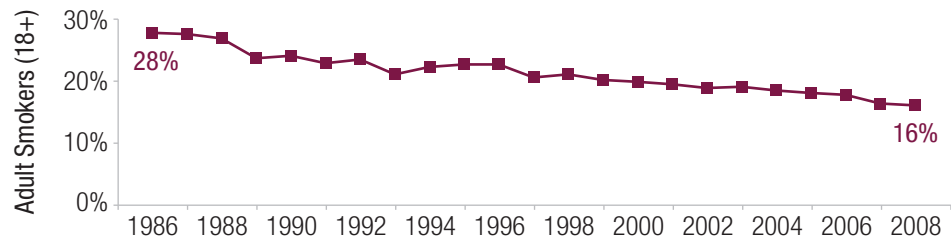
Figure 10.19 Smoking-Attributable Health Care Expenditures



Source: MDPH Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC), 2006.

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Figure 10.20 Adult Smokers (Age 18+)

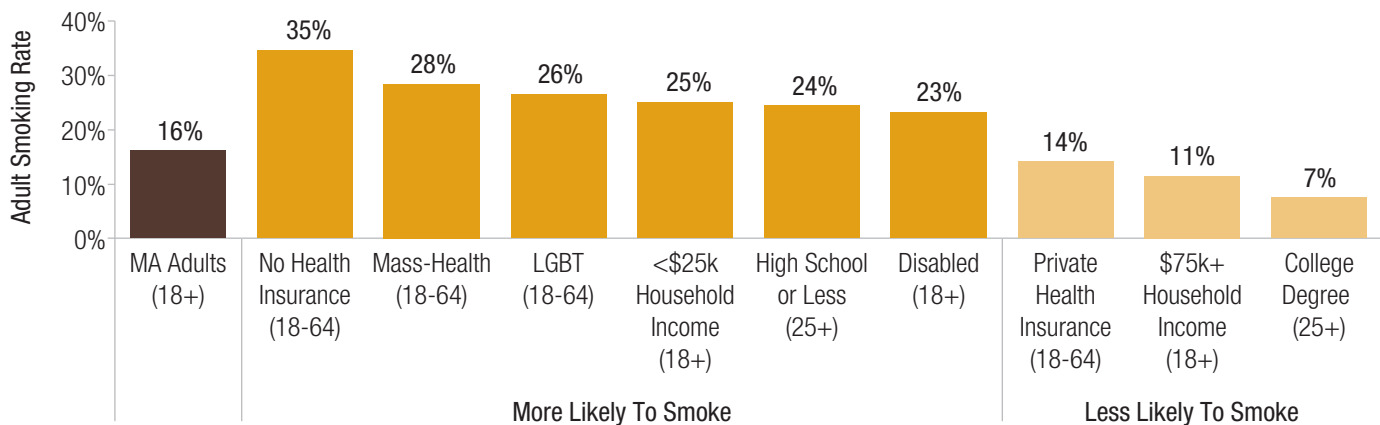


Source: MDPH BRFSS, 1988-2008.

for Hispanics. The smoking rate among young adults, age 18-24, is the highest of any age group (21%).

The burden of tobacco use is greater for some segments of the population than others. Smoking rates are highest among low socio-economic groups, people with no health insurance, people with disabilities, and the LGBT (lesbian, gay, bisexual, and transgender) population.

Figure 10.21 Adult Smoking Rate Among Subgroups



Source: MDPH BRFSS, 2008.

## Smoking among MassHealth

recipients decreased

annually by 10% since

tobacco cessation was

incorporated into the benefit

package in July 2006.

The Massachusetts Tobacco Cessation and Prevention Program (MTCP) promotes cessation and helps smokers quit through a number of strategies: making low-cost tobacco treatment available through the health care system, helping health care providers make interventions with smokers a part of routine patient care, and creating a statewide network of tobacco treatment information, training and services through a centralized resource center available to consumers and providers.

In FY07 and FY08, MTCP worked closely with MassHealth, the Massachusetts Medicaid program, to design and promote a tobacco cessation benefit. As part of the implementation of this new benefit, MTCP funded and developed smoking intervention protocols in community health



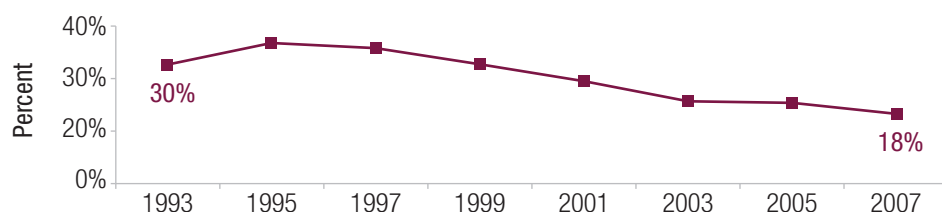
centers and rural birth hospitals to improve the ways that health care providers address tobacco use with their patients. Research findings have shown that current smoking among MassHealth recipients decreased annually by 10% since tobacco cessation was incorporated into the benefit package in July 2006.<sup>10</sup>

## Youth Tobacco Use

Eighty-five percent of adult smokers in Massachusetts had their first cigarette as teenagers. Sixty-nine percent were smoking regularly by the age of 18.<sup>11</sup>

Since reaching 35.7% in 1995, current smoking (past 30 day use) among high school students in Massachusetts has declined by 50% (Figure 10.22). In 2007, the rate of current cigarette smoking among high school students was 17.7%.<sup>12</sup>

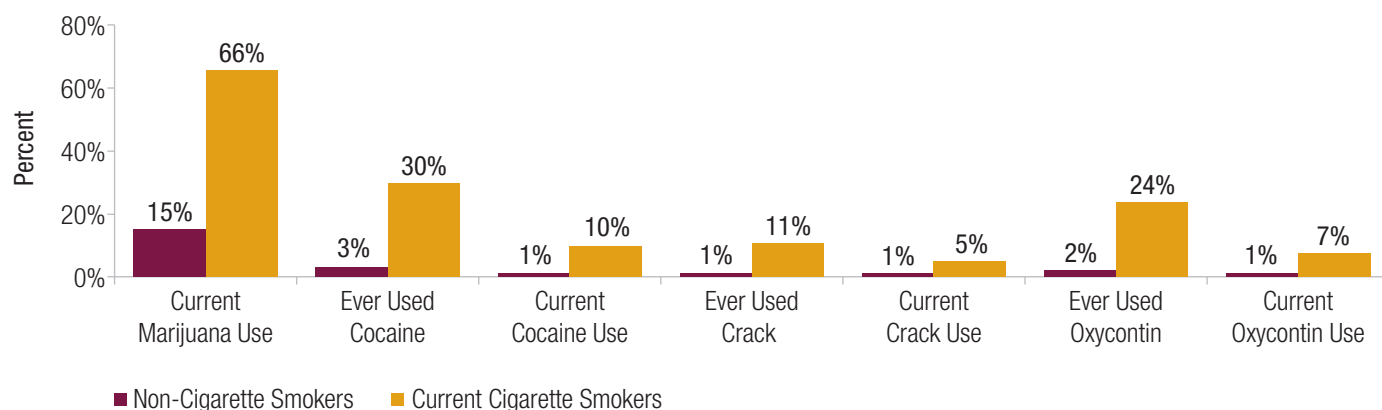
Figure 10.22 **Current Cigarette Use, High School Students**



Source: Massachusetts Department of Elementary and Secondary Education, Youth Risk Behavior Survey, 1993-2007.

In 2007, current smoking was highest among high school students with two or more friends who smoke cigarettes (53%) and those who live at home with a smoker (26%).<sup>5</sup>

Figure 10.23 **Cigarette Smoking and Illegal Drug Use, High School Students**



Source: Massachusetts Department of Elementary and Secondary Education, Youth Risk Behavior Survey, 2007.

High school students who smoke are also more likely to engage in other risky behaviors such as substance abuse. Compared to high school students who did not smoke cigarettes, current cigarette smokers were more than four times more likely to report current marijuana use (Figure 10.23), 11 times more likely to report current cocaine use, and 12 times more likely to report current OxyContin® use.<sup>5</sup>

MTCP efforts to prevent tobacco use by young people involve multiple strategies. MTCP is responsible for reducing minors' ability to purchase tobacco products, coordinating youth programs across the Commonwealth by awarding mini-grants to youth groups, holding annual youth summits, and hosting special events such as an annual film shorts competition. The84.org (named for the percentage of youth who do not smoke) - funded by MTCP - is an organization that promotes a positive, healthy lifestyle for young people. In FY07, MTCP strengthened its efforts to prevent young people from starting to smoke and saw the rate of illegal tobacco sales to minors fall by 50%.

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### Exposure to Secondhand Tobacco Smoke

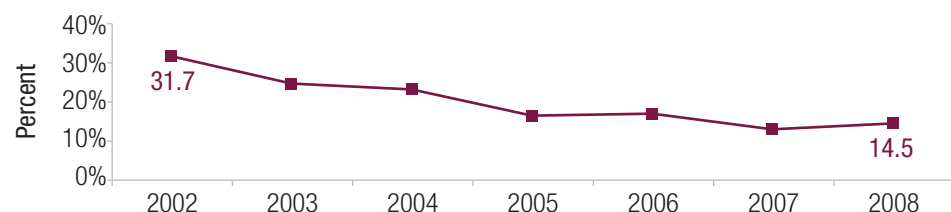
Exposure to secondhand smoke can lead to lung cancer and heart disease in non-smoking adults and to lower respiratory infections, asthma, ear infections, and sudden infant death syndrome in children. Secondhand tobacco smoke is especially harmful to pregnant women and to fetal development.

Though they are not smokers themselves, an estimated 1,000 or more Massachusetts adults and children die each year from exposure to secondhand smoke.

Exposure to secondhand smoke among adult nonsmokers declined in Massachusetts from 32% in 2002 to 15% in 2008 (Figure 10.24). In July 2004, the Massachusetts Legislature enacted a comprehensive statewide smoking ban in workplaces, including restaurants and bars. Since enactment of the Smoke-Free Workplace Law, exposure to secondhand tobacco smoke has been reduced. However, nonsmokers continue to report exposure to secondhand smoke, especially in homes, private vehicles, and other places.

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Figure 10.24 **Exposure to Secondhand Smoke for Nonsmokers**

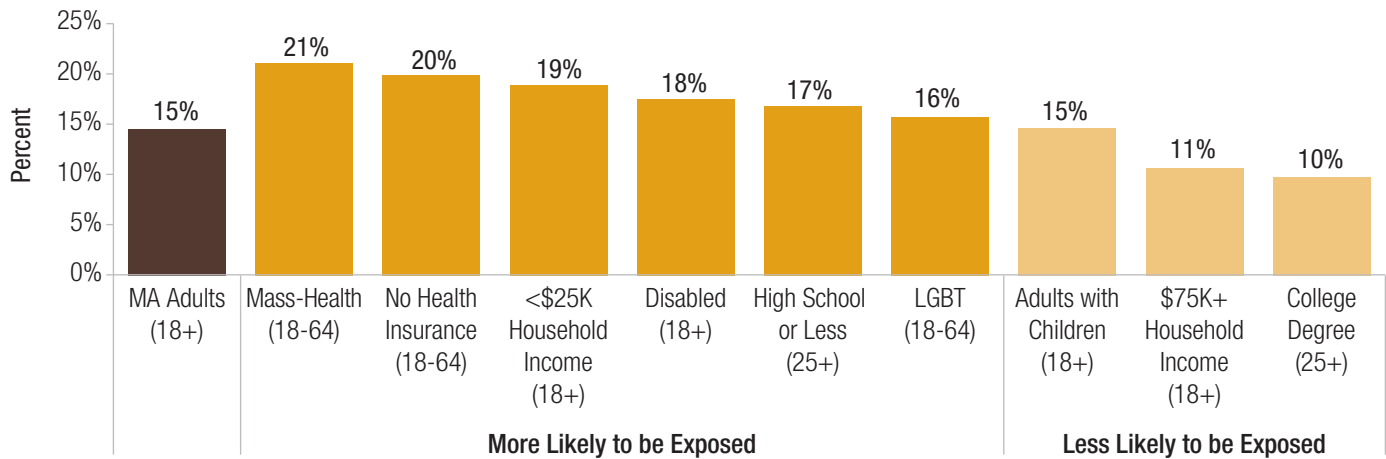


Source: MDPH BRFSS, 2002-2008.

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Exposure to secondhand smoke is most prevalent among low socio-economic groups, people with no health insurance, people with disabilities, and the LGBT (lesbian, gay, bisexual, and transgender) population (Figure 10.25).

Figure 10.25 Exposure to Secondhand Smoke for Nonsmokers by Subgroup



Source: MDPH BRFS, 2008.

### MTCP Initiatives

MTCP’s efforts are aimed at reducing smoking, decreasing health care costs, reducing the suffering caused by tobacco use, and saving lives. Moving forward, major initiatives include promoting comprehensive tobacco cessation benefit policies, expanding technical assistance to help health care providers address tobacco use with their patients, supporting increased prices of tobacco products to reduce demand, and creating an environment where all Massachusetts residents can live tobacco free.



**Constance Horgan, Sc.D.**

Professor and Director of the Institute for Behavioral Health  
Schneider Institute for Health Policy, Brandeis University

**T**here have been numerous advances in the prevention and treatment of substance use disorders (SUDs). Greater emphasis on evidence-based practices, such as screening, brief intervention and medication-assisted treatment like methadone and suboxone, and inclusion of addictions in recent federal parity legislation are among the successes that should lead to more effective and equitable treatment. However, much remains to be done.

Some areas have potential for particularly high returns. Underage drinking imposes high societal costs in terms of deaths, medical costs, work loss, and quality of life. Increasing the price of alcohol products is a strategy that has well documented effects on curbing underage drinking.

On the treatment side, we need to do a better job of reaching those who are affected by SUDs. Approaches that treat SUDs similar to other chronic conditions and recognize the frequent co-occurrence of medical and mental conditions are needed. A comprehensive continuum of care with services spanning primary prevention to acute and stabilization services, to long-term residential, to outpatient counseling, all the way to recovery support and aftercare services are necessary. Engaging other systems, especially mainstream health care and corrections are essential to meeting the tremendous unmet need for SUD services. Finally, we need to demonstrate the value of SUD services in terms of improved outcomes for clients. This can occur in a system where performance is measured and rewarded and is accompanied by using this information to continuously improve quality.

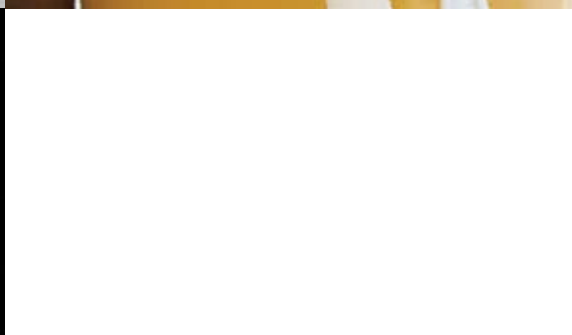
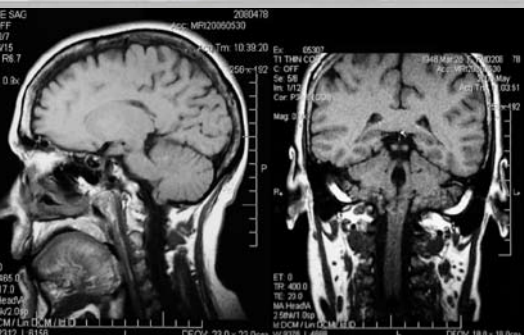
Addictions are one area where the public benefits considerably from preventing and treating the problem. Success should reduce crime, accidents, and medical costs, all of which impose economic burdens on society. We need to support our prevention and treatment efforts as we work to lessen the impact of addictions on the people of Massachusetts. Without robust and comprehensive efforts in prevention and treatment, we will pay the cost in other areas.

# FIGURE NOTES

**Figure 10.1–** Estimates are based on a three year average of the 2004-2006 surveys  
**10.5:** for persons 12 and older.

## ENDNOTES

- 1 American Society of Addiction Medicine Board of Directors. *Public Policy Statement on Core Benefit for Primary Care and Specialty Treatment and Prevention of Alcohol, Nicotine and Other Drug Abuse and Dependence*. Adopted April 1993.
- 2 Shaffer, H, Hall, M, Vander J. *Estimating the Prevalence of Disordered Gambling Behavior in the United States and Canada: A Meta-Analysis 1997*. American Journal of Public Health 89(9);1999(1369-1376).
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- 7 Manchikanti, L. National Drug Control Policy and Prescription Drug Abuse: Facts and Fallacies. *Pain Physical Journal* 2007; 10:399-424.
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- 9 Massachusetts Department of Public Health, Massachusetts Behavioral Risk Factor Surveillance System (BRFSS), 1986 - 2008.
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- 11 Massachusetts Department of Public Health, Massachusetts Behavioral Risk Factor Surveillance System (BRFSS), 2007.
- 12 Massachusetts Department of Public Health, Massachusetts Tobacco Control Program. Trends in Youth Tobacco Use in Massachusetts, 1993 – 2007 (February 2008). Accessed August 2009 at: [http://www.mass.gov/Eeohhs2/docs/dph/tobacco\\_control/adolescent\\_tobacco\\_use\\_youth\\_trends\\_1993\\_2007.pdf](http://www.mass.gov/Eeohhs2/docs/dph/tobacco_control/adolescent_tobacco_use_youth_trends_1993_2007.pdf).





# Unintentional Injury



Injuries are the leading cause of death for people ages one to 44 years of age and are the third leading cause of death for all ages combined. In fact, injuries result in more deaths of children and youth ages one to 19 years than all other causes combined.

The term *injury* includes unintentional injuries, sometimes called “accidents,” self-inflicted injuries, suicides, assault-related injuries and homicides. Injuries can be fatal or nonfatal.

In 2007, there were nearly 3,000 deaths<sup>1</sup>, 60,000 hospitalizations<sup>2</sup>, and more than 700,000 emergency department (ED) visits<sup>3</sup> among Massachusetts residents who suffered injuries.

The financial burden of injuries is enormous. Annually, injuries in the US generate lifetime costs to society of \$406 billion, including \$80 billion in medical care.<sup>4</sup> Lifetime costs reflect the fact that the “cost” of any one injury may span across a lifetime, involving rehabilitation, long term care, and complications. In Massachusetts acute care hospital charges associated with injury were more than \$2.6 billion in 2007, not including outpatient care, Emergency Medical Services, rehabilitation or long term care costs or lost wages.

**On an average day in 2007, eight Massachusetts residents died of injuries, more than 185 were hospitalized, and nearly 2,000 were treated at emergency departments for injuries.**

**Injuries are not chance occurrences, but are predictable, and largely preventable.**

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## **Injuries are Predictable and Preventable!**

Injuries are not chance occurrences, but are predictable, and largely preventable. The data presented here highlight the leading causes and consequences of injury, populations at greatest risk, and the circumstances of these injuries. Injury prevention methods are discussed within each subsection and at the end of this chapter.

The data presented below refer to unintentional injuries.<sup>5</sup> Assault-related and self-inflicted injuries are covered in Chapters 12 and 13. Only Massachusetts residents are included unless otherwise noted.

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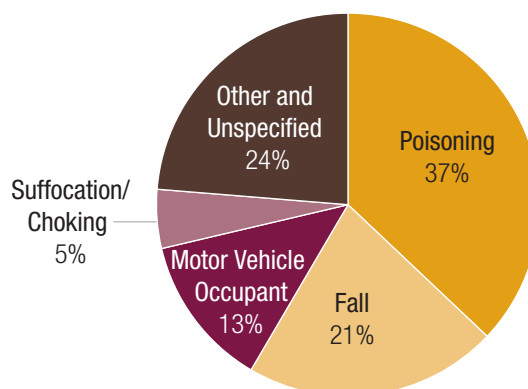
## **Unintentional Injury**

In 2007 there were 2,113 unintentional injury deaths, 47,077 hospitalizations and 660,989 ED visits for nonfatal unintentional injuries. Unintentional injuries accounted for seven of ten injury deaths and more than nine of ten injury-related ED visits.

The subsections below provide details on traumatic brain injury, or “head injury,” and injuries resulting from falls, motor vehicle occupant and pedestrian crashes, fires, drownings and poisonings. These are priority areas for prevention at the MA Department of Public Health.

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Figure 11.1 **Leading Causes of Unintentional Injury Deaths**



Source: MDPH Death File, 2007.

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## **Traumatic Brain Injuries**

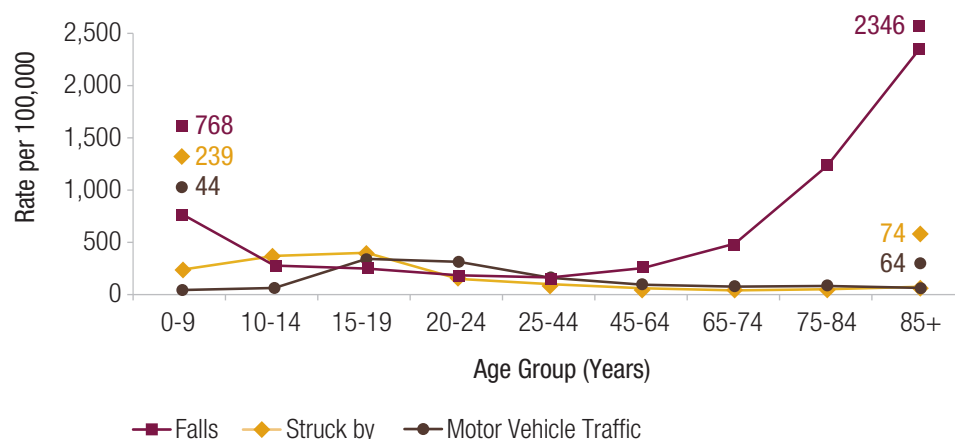
Traumatic brain injuries (TBI) occur after a blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Not all blows or jolts to the head result in a TBI. The severity of a TBI may range from “mild,” – such as a brief loss of consciousness – to “severe” – where there is an extended period of unconsciousness or amnesia after an injury.<sup>6</sup>

In Massachusetts, in 2007, there were 584 unintentional TBI-related deaths, 5,195 hospitalizations and 40,877 ED visits associated with nonfatal TBI. From 2000 to 2007, rates of TBI death rose 57% and rates of hospitalization rose 29%. ED visits associated with nonfatal TBI rose 41% from 2002 (the first year of data) to 2007. The reasons for these increases are not clear.

Residents ages 65 years and older have the highest rates of TBI death and hospitalization, mainly due to falls. Infants less than one year have the highest rates of ED treatment for TBIs, also largely due to falls.

The leading causes of TBI vary by age group, with falls a leading cause among infants, young children and older adults. “Struck by” injuries are the leading cause of TBI among youth 10-19 years old, the majority of these due to sports injuries. Motor vehicle traffic injuries are the leading cause among 20-24 year olds.

Figure 11.2 Traumatic Brain Injury Rates Across the Lifespan by Leading Causes of Injury



Sources: MDPH Death File, 2007; MA Division of Health Care Finance and Policy Inpatient Hospital and Emergency Department Discharge Databases, FY2007. All data summed.

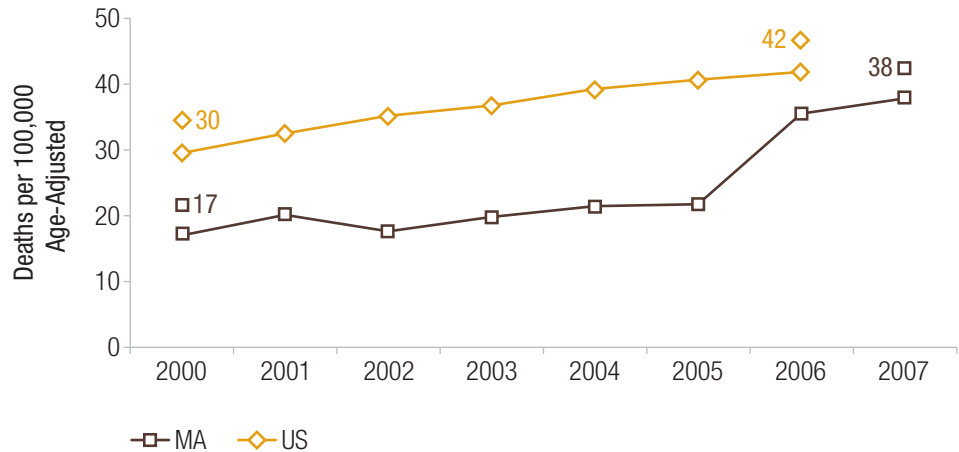
### Falls Among Older Adults (65+ Years)

Fall injuries are a serious and increasing health problem among Massachusetts adults aged 65 years and older. Falls can occur in a variety of situations such as on steps or stairs, getting out of bed or into the bathtub, walking on the sidewalk, while engaged in sports, while working, or around the home.

In 2007, there were 363 deaths, 19,500 hospitalizations, and 37,453 ED visits involving nonfatal falls among adults 65 and older. The age-adjusted fall death rate among older adults in Massachusetts increased 122% from 2000 through 2007. A similar trend occurred nationally (Figure 11.3). Hospitalization rates associated with nonfatal falls in older adults increased 13% from 2000 to 2007.

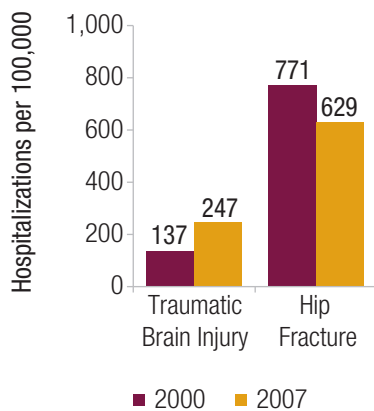
**Hospital charges associated with fall injuries in older adults totaled \$546 million in 2007.**

Figure 11.3 Trends in Fall Death Rates Among Older Adults



Sources: MDPH Death File; CDC Web-based Injury Statistics Query and Reporting System (WISQARS).  
 \*MA 2007 rate statistically different from 2000 rate at  $p \leq 0.05$ .

Figure 11.4 Fall-related Hospitalization Rates Associated with Traumatic Brain Injury and Hip Fracture, 65+



Source: MA Division of Health Care Finance and Policy Inpatient Hospital Discharge Database.

\*2007 rates are statistically different from 2000 rates ( $p \leq 0.05$ ).

Nonfatal fall injuries can result in the loss of independence and a downward spiral in one's health. In 2008<sup>7</sup>, 15.6% of older adults reported at least one fall in the preceding three months. Falls were reported more in those who reported no physical exercise (19.5%), compared with those who engaged in any exercise (13.7%), and falls were reported more among individuals disabled and needing help (28.9%), compared with those who were not (13.8%).

In 2007, where circumstance was known, one of three fatal falls in older adults occurred on stairs or steps; more than one-half (55%) occurred either inside or outside the home, 14% occurred in a nursing home, and 4% occurred at a hospital.

Hospitalization rates associated with fall-related TBIs among those older than age 65 have increased 80% from 2000 to 2007, while those associated with fall-related hip fractures have decreased 18% during the same time period. While the reason for the decrease in hip fractures is not certain, it may be due to advances in the treatment of osteoporosis or increases in body mass indices.<sup>8</sup>

## Fall Prevention

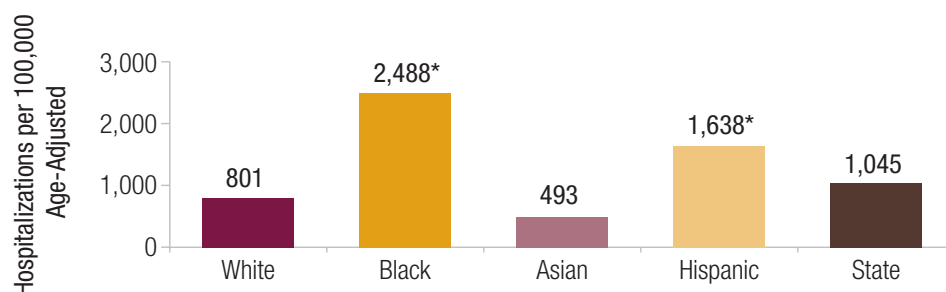
Fall prevention requires a multidisciplinary approach, including environmental modifications (grab bars, hand rails, adequate lighting, contrast markings), medication reviews, balance and strength training, and regular comprehensive vision exams. Collaboration among public health professionals, physicians, nurses, physical therapists, pharmacists, vision professionals, engineers, policy makers, and others optimizes prevention strategies.

## Motor Vehicle Occupant Injuries<sup>9</sup>

The Massachusetts motor vehicle (MV) occupant fatality rate is among the lowest in the nation (age adjusted rate of 4.1 per 100,000 in 2007). The US age adjusted rate was 10.9 per 100,000 in 2006 (the latest year available).

In 2007, there were 272 MV occupant fatalities, 2,932 hospitalizations, and 64,551 ED visits associated with nonfatal MV occupant injuries among Massachusetts residents. While occupant deaths in 2007 did not differ statistically by race and ethnicity, blacks and Hispanics had higher estimated rates of acute care hospital events for nonfatal MV occupant injury compared with whites and Asians.

Figure 11.5 Acute Care Hospital Utilization Rates for Nonfatal Motor Vehicle Traffic Occupant Injury

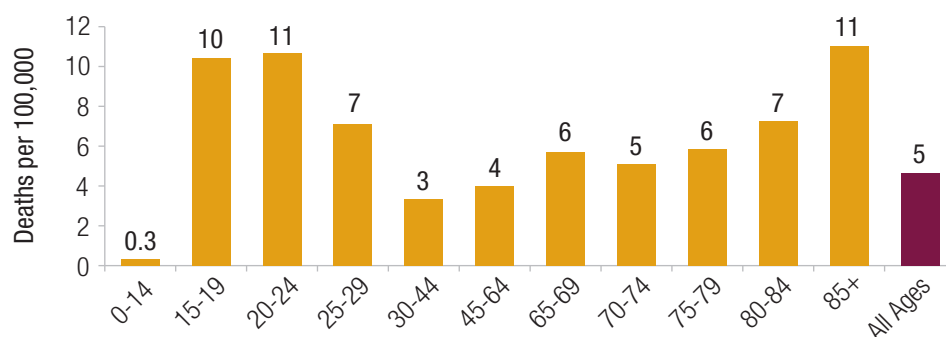


Sources: MA Division of Health Care Finance and Policy Inpatient Hospital and Emergency Department Discharge Databases (summed), FY2007.

\*Rates for Blacks and Hispanics are statistically higher than Whites and Asians ( $p \leq 0.05$ ).

Three year average annual MV occupant fatality rates are highest among males and differ substantially by age group. Of the MV occupant fatalities in 2007 where seat belt use was known, 66% were not wearing seat belts.<sup>10</sup> Massachusetts has historically ranked lower than the national average in seat belt use. In a 2009 observational survey, seat belt use was 74% in the Commonwealth.<sup>11</sup> The overall national seat belt use in 2009 was 84%.<sup>12</sup>

Figure 11.6 Average Annual Motor Vehicle Traffic Occupant Fatality Rates by Age Group



Source: MDPH Death File, 2005-2007.

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## Motor Vehicle Occupant Injury Prevention

MV occupant injury prevention strategies include safe road and vehicle design, the enforcement of laws requiring seat belts and child safety seats, laws pertaining to junior operators, alcohol and speed limits, and sobriety checkpoints.

**Massachusetts residents  
ages 65 years and older have  
the highest rate of pedestrian  
deaths, with a 3 year average  
annual rate (2005-2007)  
three times the rate of those  
under 65 years.**

---

## Pedestrian Injuries

There were 81 pedestrian deaths, 675 hospitalizations and 3,590 ED visits associated with nonfatal pedestrian injury in 2007. Pedestrian injuries include injuries to individuals hit by motor vehicles (predominantly) or other transport vehicles. They do not include trips and falls on sidewalks or roads or injuries not involving a transport crash. Decreasing pedestrian injuries requires a multidisciplinary approach from traffic engineers, planners, smart growth advocates, police, policy makers, public health, and others. Strategies include safe street and sidewalk design, enforcement of speed limits, snow and ice removal, and “Safe Routes to School”, a school-based walking program that includes pedestrian safety training.

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## Fire Injuries

Over the past two decades, there has been success in reducing the rate of fire deaths. Age-adjusted fire death rates in MA decreased 60% from 1990 through 2007 and 40% in the US from 1990-2006 (Figure 11.7).

In 2007, according to the Massachusetts Fire Incident Reporting System, there were 49 unintentional fire deaths<sup>13</sup> (including civilians and firefighters). Additionally, there were 185 hospitalizations and 1,711 ED visits for nonfatal fire injuries among MA residents in 2007.

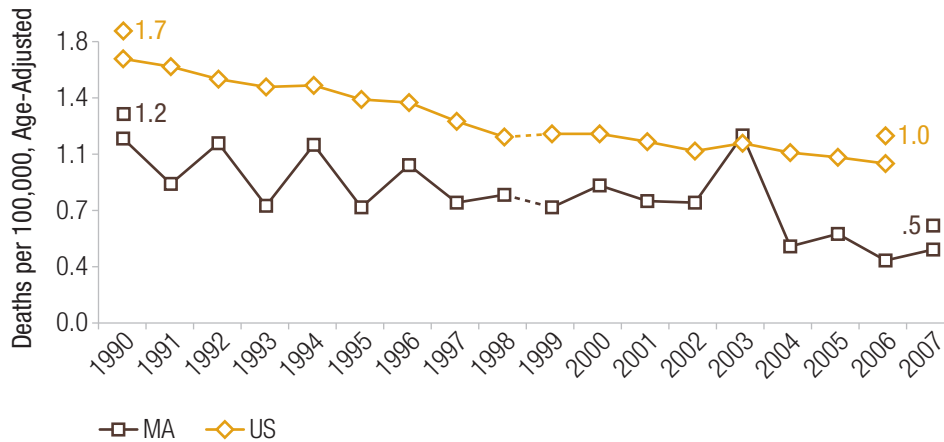
There are geographical differences in the rate of fire injuries in Massachusetts. From 2003 to 2007, average annual fire death rates in the Southeastern region were higher than the overall state rate (1.2 vs. 0.7 per 100,000), while rates in the Metrowest region were lower (0.4 per 100,000) than the state rate.

Prevention efforts that combine education, engineering and law enforcement are critical in reducing the burden of fire injuries in the state. Legislative funding has supported the Student Awareness of Fire Education (S.A.F.E.) Program, which has enabled fire fighter educators to teach fire prevention and safety at schools and in other community settings. The Commonwealth also has strong laws promoting fire prevention, including those that require smoke alarms.

Working smoke alarms have been shown to greatly reduce fire injury by providing an early warning and time for escape. Smoke alarm installation programs are an effective method for increasing the number of working



Figure 11.7 Fire/Flame Death Rates



Sources: MDPH Death File; CDC Web-based Injury Statistics Query and Reporting System (WISQARS).  
 \* Statistically different from 1990 rate at  $p \leq 0.05$ .

smoke alarms, particularly for populations at high risk. In Massachusetts, smoke alarms either failed to operate or were not present in 38% of the 2007 residential fire deaths.<sup>14</sup>

## Drowning/Near Drowning

Unintentional drowning and near drowning can occur at any age and in all types of water settings. In 2007, there were 51 drowning deaths and 195 acute care hospital events for nonfatal submersion injuries. Drowning was the leading cause of injury death in one to four year olds, accounting for nearly 40% of these deaths from 2005-2007. During this 3-year period, 16% of all drowning in MA occurred in swimming pools, 7% in bathtubs, and 56% in natural water. Another 21% occurred in an unspecified or “other” water source.

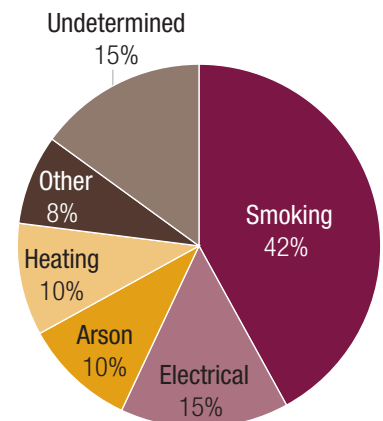
Major risk factors for drowning include lack of barriers such as pool fencing, and lack of constant supervision while infants and toddlers are in the bath or near any water.

Lack of personal floatation device use in recreational boating is also a major risk factor in drowning. In 2006, the US Coast Guard received reports of 4,967 boating incidents; 3,474 boaters were reported injured, and 710 died. Among those who drowned in boating incidents, nine out of ten were not wearing life jackets.<sup>15</sup>

## Poisoning

Poisoning, which includes drug overdose, is the leading cause of injury death in Massachusetts and the second leading cause of injury hospitalization. In 2007, poisoning resulted in 846 deaths, 2,576 hospitalizations

Figure 11.8 Leading Causes of Residential Fire Deaths



Source: MA Office of the State Fire Marshal Fire Incident Reporting System 2007.

**Among those who drowned in boating incidents, nine out of ten were not wearing life jackets.**

**Poisoning, which includes drug overdose, is the leading cause of injury death in Massachusetts.**

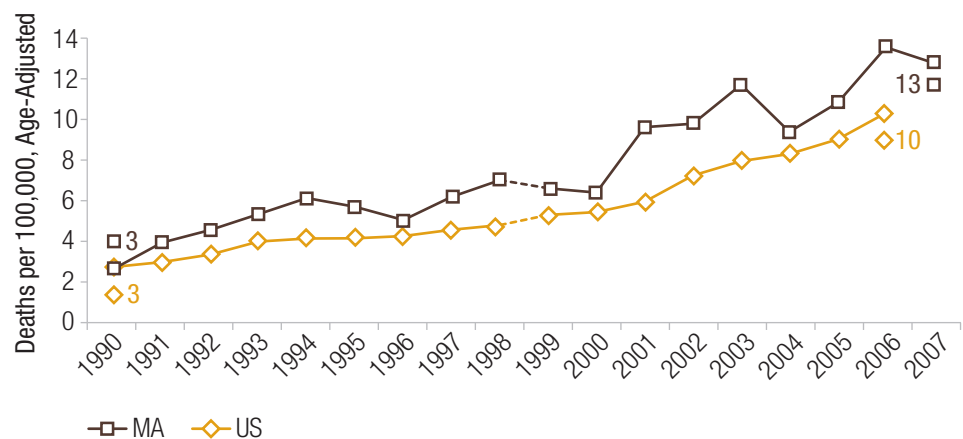
and 7,223 ED visits. Poisoning refers to the damaging effects of ingestion, inhalation or other exposure to pharmaceuticals, illicit drugs, chemicals and pesticides, heavy metals, gases, and common household substances.<sup>16</sup>

From 1990 through 2007, age-adjusted poisoning death rates increased 382% in MA. From 1990 through 2006 (the latest year for which national data are available) the US deaths from poisoning increased 277% (Figure 11.9).

In Massachusetts, much of this increase has been driven by opioids, such as heroin, oxycodone (OxyContin®), fentanyl, and methadone (see Chapter 10 for more information on substance abuse data).

In 2007, 73% of these deaths were associated with an opioid; 32% were associated with cocaine (these two groups are not mutually exclusive). Poisoning mortality rates are highest among males of all ages, and among persons ages 25-54 years.

Figure 11.9 Poisoning Death Rates



Sources: MDPH Death File; CDC Web-based Injury Statistics Query and Reporting System (WISQARS).  
 \*The rate in 2009 is statistically different from the 1990 rate at  $p \leq 0.05$ .

Nonfatal poisoning events are also on the rise. From 1994 through 2007, hospitalization rates increased 64%, and from 2002 (the first year for which data are available) through 2007, ED visit rates associated with poisoning increased 6%. Hospitalization rates associated with poisoning are highest among individuals 75 years and older while ED visit rates were highest among children under 5 years of age.

The Regional Center for Poison Control and Prevention is a key partner in helping Massachusetts residents and health care providers manage and treat poisoning exposures. In 2007, specialists at the Poison Center responded to more than 51,000 calls from MA residents and health care providers. Exposures to children five years and under represent 44% of these calls.

The Poison Center is a cost-efficient model for providing critical life-saving care. In 2007, more than 76% of all calls received by the Poison Center were managed over the telephone by a poison specialist and did not require referral to a health care facility. This approach saves the health care system millions of dollars.

**More than 76% of all calls received by the Poison Center in 2007 were managed over the telephone, saving the health care system millions of dollars.**

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## Strategies for Injury Prevention

The most successful injury prevention programs combine four basic strategies. These are known as the “4 E’s” of injury prevention:

- **Engineering/environmental interventions.** Changes in the design of products and in the physical environment can reduce injury. Examples include improvements in the design of sidewalks, roads, cars, trains, playground surfaces, toys, children’s clothing, child-resistant medication packaging, the existence of safety features such as smoke and carbon monoxide detectors, lighting, and handrails/grab bars.
- **Education/behavior change and interventions aimed at the individual.** Efforts to modify behavioral and medical risk factors for injury such as seat belt use, driver education, planning and practicing a home escape plan, and improvements in vision, bone density, and balance and strength can reduce injury.
- **Enactment and enforcement of policies.** Passage and enforcement of laws and regulations can reduce injury. Laws which aim to reduce injury in Massachusetts include seat belt and child passenger safety requirements, motorcycle and bike helmet requirements, pool fencing, and smoke and carbon monoxide detector requirements.
- **Emergency medical response and trauma management.** While not primary injury prevention methods, the presence of well coordinated Emergency Medical Systems (EMS), access to poison control centers, and the existence of trauma management protocols after injury has occurred can prevent fatalities and reduce the severity of injuries.

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## Summary

Injury prevention requires collaboration among many stakeholders including public health and highway safety professionals, town and regional planners, engineers and manufacturers, health care providers, policy makers, educators, law enforcement and fire safety personnel, emergency medical services, the media, the health care industry, private citizens, and many others.



**Cindy Rodgers, MPH**

Former Director, Injury Prevention and Control Program, MDPH

**A**lthough Massachusetts injury fatality rates, on the whole, are lower than much of the nation, the deaths of nearly 3,000 residents along with three quarters of a million hospital admissions and emergency department visits each year should be wholly unacceptable, since most of these can be easily prevented. The magnitude of the problem is so large and injuries are so common that our society has come to accept them as inevitable. Due to the mounting toll in human lives and financial cost, there is an urgent need to change the perception of the public and policy makers from “injuries as accidents” to “injuries are predictable and preventable,” and to develop the political will needed to provide the resources and infrastructure to implement effective injury prevention interventions.

The MDPH Injury Prevention and Control Program (IPCP) was established 30 years ago and today is one of the oldest and most comprehensive injury prevention programs in a state health department. Despite the program's longevity and successes, there remain serious gaps which restrain the program from reaching its goal of reducing injury and death in the Commonwealth. Primary among these are:

- **State funding.** Since its inception, the IPCP has relied solely on ever diminishing, highly competitive federal grants to support staff and programming efforts. In its 30 years there has not been one state dollar provided to the program to prevent unintentional injury – the leading cause of death for Massachusetts residents ages 1 – 44! Stable state funding is needed to support core injury prevention and surveillance staff and to enhance injury prevention interventions in local communities.
- **Implementation of interventions for priority injuries.** In 2004 and 2007 the MDPH released the Massachusetts State Injury Prevention Plan: Maximizing Our Efforts and Traumatic Brain Injury: A Case for Prevention, respectively. These reports identify gaps and action steps for many of the injuries detailed in this chapter. Implementation of these recommendations and action steps should be vigorously acted upon to reduce the burden of injury in Massachusetts. Foremost among these are: passage of a primary

enforcement seat belt law; broadening the “Keys to Independence” campaign to eliminate fall hazards in the homes of older adults; support of legislation to ban the sale and use of all-terrain vehicles by children under the age of 14; and support the adoption of requirements for automatic fire sprinklers in new one- and two-family homes.

- **Massachusetts PINN (Prevent Injuries Now! Network).** Preventing injury is a shared responsibility across many professions. Reducing the injury burden in Massachusetts requires the collaborative work of urban planners, social workers, epidemiologists, engineers, clinicians, fire safety personnel, product manufacturers, law enforcement, policy makers, researchers, communication professionals and many others. Mass PINN was formed in 2006 to provide such a multidisciplinary group with an opportunity to share information and data, forge partnerships, and advocate for sensible public health and safety initiatives at both the state and federal levels. This organization needs modest financial support and buy in from the highest levels of state government in order to continue its valuable efforts.



# FIGURE NOTES

**Figure 11.2:** “Motor Vehicle Traffic” includes occupants, motorcyclists, pedestrians, bicyclists and others injured in traffic. “Struck by” includes injuries caused by strikes to the body by an object or person such as in sports, against furniture or a falling object. Population data are from National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000 – July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the US Census Bureau; released August 7, 2008. Available from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> as of September 5, 2008.

**Figure 11.3:** US data for 2007 not yet available. The sharp increase in Massachusetts rates from 2005 to 2006 may be due to increased identification of these types of deaths at the Massachusetts Medical Examiner’s Office. Includes deaths among residents ages 65 years and older.

**Figure 11.5:** Estimates based on discharges occurring 4/1/07 – 9/30/07.

**Figure 11.7:** Population data were from National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000 – July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the US Census Bureau; released August 7, 2008. Available from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> as of September 5, 2008. The spike in MA rates in 2003 was due to the 33 deaths that occurred in the RI Station Night Club fire. The broken line represents a change in the coding of death data that occurred across the US beginning in 1999. US data for 2007 are not yet available.

**Figure 11.9:** US data for 2007 are not yet available. The broken line represents the change in the coding of death data that occurred across the US beginning in 1999. Population data were from National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000 – July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the US Census Bureau; released August 7, 2008. Available from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> as of September 5, 2008.



# ENDNOTES

- 1 Unless otherwise indicated, the death data presented in this chapter are from the Registry of Vital Records and Statistics, MDPH. All annual data presented represent a calendar year.
- 2 Unless otherwise indicated, the hospitalization data presented in this chapter are from the MA Inpatient Hospital Discharge Database, MA Division of Health Care Finance and Policy. All annual data presented represent a fiscal year (October 1 – September 30).
- 3 Unless otherwise indicated, the emergency department discharge data presented in this chapter are from the Massachusetts Emergency Department Discharge Database, MA Division of Health Care Finance and Policy. All annual data presented represent a fiscal year (October 1 – September 30).
- 4 Finkelstein EA, Corso PS, Miller TR, Associates. *Incidence and Economic Burden of Injuries in the United States*. New York: Oxford University Press; 2006.
- 5 The subsections of this chapter speak to unintentional injuries. With the exception of poisoning deaths all of the data reported in these subsections reflects unintentional injuries only. Poison deaths in Massachusetts prior to 2005 were often classified as “undetermined intent” when there was no evidence of a suicide or homicide. Beginning in 2005, these deaths were classified as unintentional. In order to examine trends over time, the poison death data presented in this chapter include both unintentional deaths and deaths of undetermined intent.
- 6 Centers for Disease Control and Prevention. What is traumatic brain injury? Available at <http://www.cdc.gov/ncipc/tbi/TBI.htm>. Accessed August 11, 2009.
- 7 MDPH, Massachusetts Behavioral Risk Surveillance System, 2008.
- 8 Leslie WD, O'Donnell S, Jean S, et al. Trends in hip fracture rates in Canada. *JAMA*. 2009; 302(8):883-9.
- 9 Injuries sustained as a “motor vehicle traffic - occupant” includes drivers and passengers injured in a motor vehicle and excludes motorcyclists, pedestrians, train passengers and bicyclists; “unspecified person” injured in motor vehicle traffic are included in the occupant counts provided.
- 10 National Highway Traffic Safety Administration. Fatality Analysis Reporting System. Available at <http://www-fars.nhtsa.dot.gov/Trends/TrendsRestrains.aspx>. Accessed August 12, 2009.
- 11 The Commonwealth of Massachusetts. Executive Office of Public Safety and Security. Press Release (August 11, 2009).
- 12 National Highway Transportation Safety Administration. Seat belt use in 2009 – Overall Results. Traffic Safety Facts. September 2009.
- 13 The number of fire-related deaths reported by the Massachusetts Fire Incident Reporting System differs from that reported by the Massachusetts Registry of Vital Records and Statistics due to differences in case definition.
- 14 Massachusetts Fire Incident Reporting System, Massachusetts Office of the State Fire Marshal.
- 15 Centers for Disease Control and Prevention. Water-related injuries: Fact Sheet. Available at <http://www.cdc.gov/HomeandRecreationalSafety/Water-Safety/waterinjuries-factsheet.htm>. Accessed August 11, 2009.
- 16 Centers for Disease Control and Prevention. Unintentional and undetermined poisoning deaths – 11 states, 1990-2001. *MMWR* 2004; 53: 233-238.



# Suicide and Self-Inflicted Injury



Suicide is a significant and preventable public health issue. On average, there are two to three times as many suicides in the Commonwealth as homicides. In 2007, the latest year for which mortality data are available, there were 504 recorded suicides among Massachusetts residents. In comparison, there were 183 homicides in that same year.

While the term “suicide” refers to completed suicides, nonfatal self-inflicted injuries can include suicide attempts and other self-injury such as intentionally cutting or burning oneself.

In fiscal year 2007, there were 4,305 acute care hospital stays for nonfatal self-inflicted injuries and an additional 6,720 emergency department visits.

The impact of suicide is enormous: it is estimated, very conservatively, that for every suicide completion there are six loved ones who are left behind to experience the particularly complicated grief that comes from losing someone to suicide. In the last ten years, with a range of suicide deaths between 400 and 500 per year, there are between 24,000 and 30,000 survivors in the

In an average week in 2007:

- » 10 Massachusetts residents died by suicide.
- » More than 200 were treated at an acute care hospital for self-inflicted injuries.

**In the past ten years,  
24,000 to 30,000 survivors  
have been affected by the  
suicide death of a loved one.**

Commonwealth who have been directly effected. Along with the sadness that attends any death, most of these survivors also suffer from guilt. Many feel tremendous pain that they could have/should have “done something” to prevent the suicide.

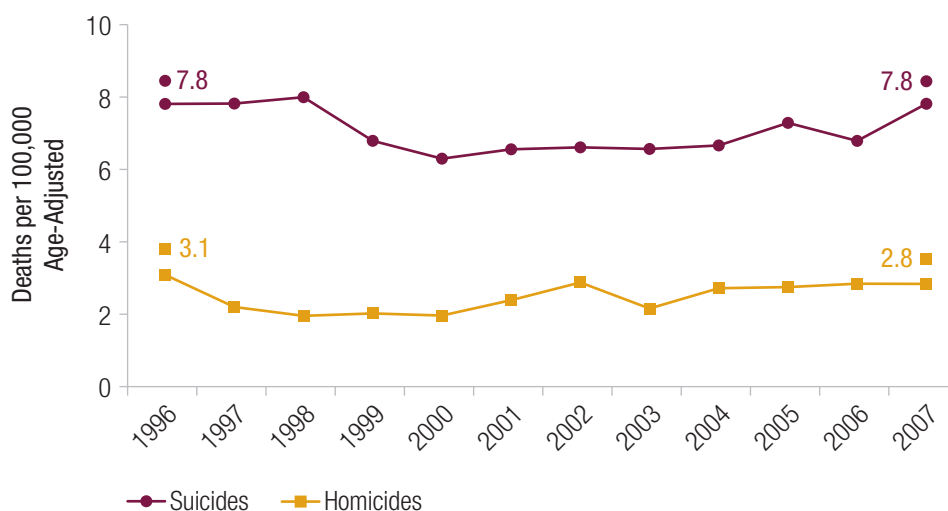
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### Scope of the Problem in Massachusetts

Despite the alarming numbers of suicide in Massachusetts, the rate of suicide (7.8 per 100,000 residents) is lower than that of the US (11.2 per 100,000 residents in 2006).

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Figure 12.1 **Suicide and Homicide Rates**



Source: MDPH Death File, 1996-2007.

Most poisoning-related suicides and nonfatal self-inflicted hospital stays are the result of drug overdoses.

Although hospitals are not required to report suicide attempts, they do report self-inflicted injuries which serve as indicators of suicide attempts. The overwhelming majority of hospital stays for self-inflicted injuries are for poisonings, including drug overdoses. Poisoning is the most common method for a non-lethal suicide attempt.

**Males account for  
approximately 80% of  
completed suicides in  
Massachusetts.**

Hanging is the leading method for completed suicide in Massachusetts and firearms are the second most common method. Massachusetts differs in this regard from the US. According to the American Association of Suicidology, nationally, firearms account for approximately 50% of all suicides. In states where household gun ownership is high, the suicide rate is also high.

In Massachusetts, as across the country, there are differences in the numbers and rates of male and female suicide and self-inflicted injury. Females attempt suicide at a rate approximately three times that of males. However, since females tend to use less lethal means than males, males complete suicide at higher numbers and rates.

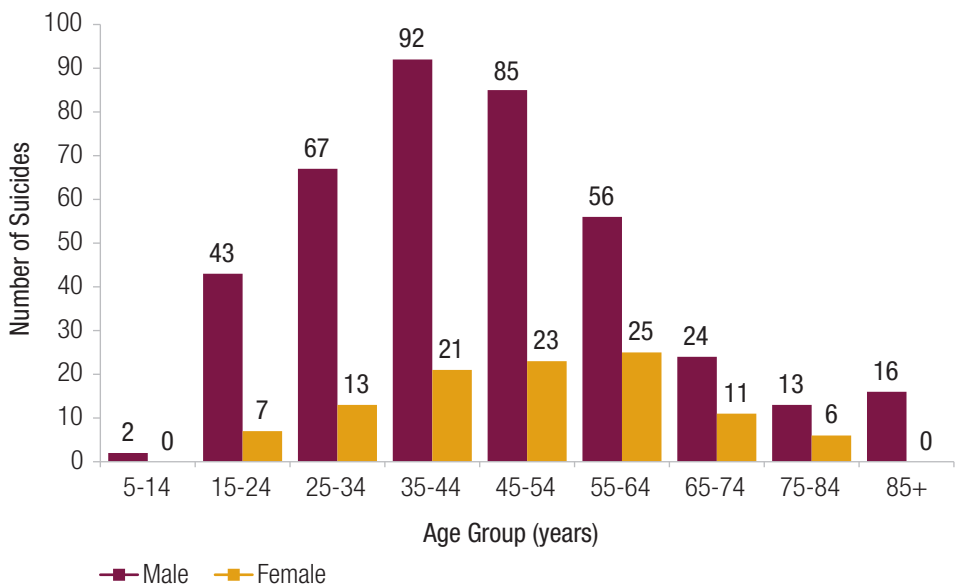
Gender and Age

In 2007, there were 398 suicides by males (12.7 per 100,000) compared with 106 by females (3.2 per 100,000).

Most suicides occur in the middle age population; 44% of all suicides were among individuals ages 35-54 years.

Most suicides occur in the middle age population; 44% of all suicides were among individuals ages 35-54 years.

Figure 12.2 Suicides by Gender and Age



Source: MDPH Death File, 2007.

Figure 12.3a Suicides Among Males by Method

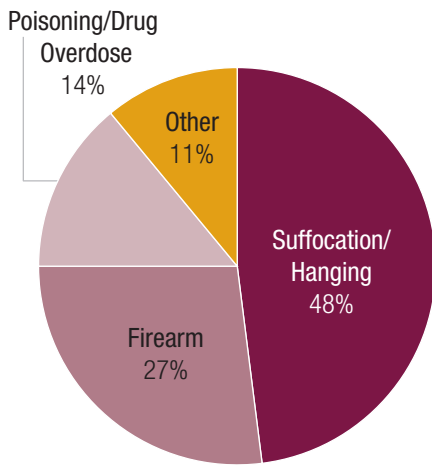
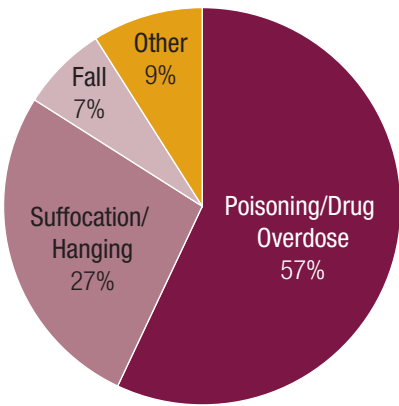


Figure 12.3b Suicides Among Females by Method



Source: MDPH Death File, 2007.



Among males, the highest number of suicides was among those 35-44 (N=92), but males ages 85 and older had the highest rate (38.9 per 100,000).

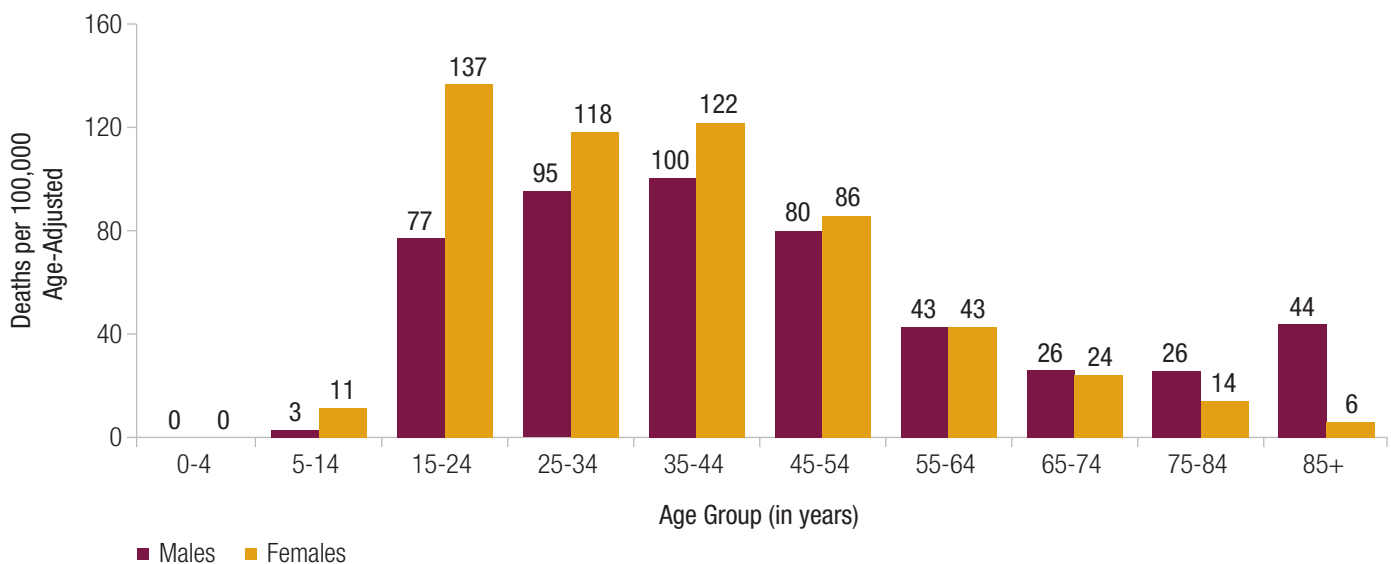
Among females, the highest number and rate of suicides were among those 55-64 years of age (N=25, rate=6.6 per 100,000).

The leading suicide methods also vary by gender. For males, suffocation and firearms were the most common methods. For females, the leading methods were poisoning, followed by suffocation.

Eighty percent of nonfatal self-inflicted hospital stays, a total of 3,458 individuals, were due to poisoning, the leading method for *both* males and females.

Hospital stays for non-lethal self-inflicted injuries vary dramatically with age and gender.

Figure 12.4 Nonfatal Hospital Stays Due to Self-Inflicted Injuries by Age and Gender



Source: MA Hospital Discharge Database and MA Observation Stay Database, Division of Health Care Financing and Policy, FY2007.

**The highest rate of hospital stays for self-inflicted injuries was among females aged 15-24.**

The overall rate of hospital stays for self-inflicted injury among MA residents was 66.7 per 100,000. Females had a higher rate than males. Up to the age of 64, females had higher rates of hospital stays for self-inflicted injury than did men. Among females, the highest rate was in the 15-24 year age group. Among males, the highest rate was in the 35-44 year age group.

Up to the age of 64, females had higher rates of hospitalization for self-inflicted injury than did men. Among females, the highest rate was in the 15-24 year age group (136.6 per 100,000); among males, the highest rate was in the 35-44 year age group (100.4 per 100,000).



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## Racial/Ethnic Differences

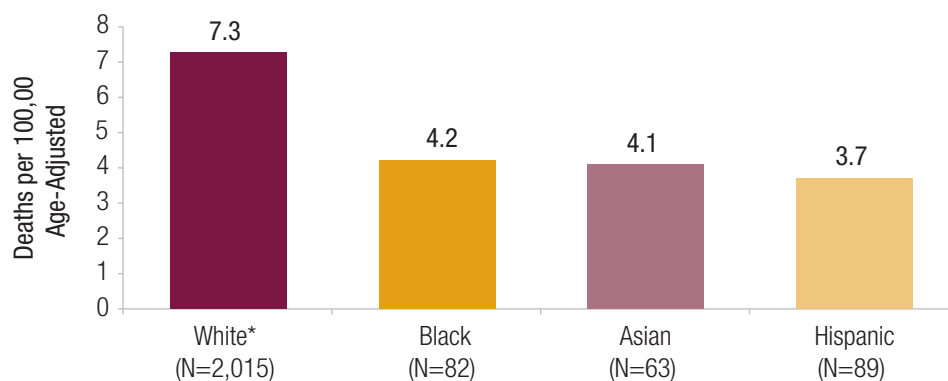
The great majority of suicide deaths of Massachusetts residents are of White, Non-Hispanic individuals. There are trends, however, noted in the literature<sup>1</sup> that point to increases in suicide rates among young Blacks and high rates of attempts by young female Hispanics. American Indians have the highest rates of suicide of the race/ethnic groups, though their numbers are small in Massachusetts.

Average annual rates for the time-period 2003–2007 were highest among American Indian, Non-Hispanic residents. Although the difference between this rate and the others was not statistically significant due to the small numbers (and thus they do not appear in Figure 12.5,) they are still socially significant and, therefore, warrant attention.

White, Non-Hispanic residents had the second highest rate (7.3 per 100,000, N=2,015), which was statistically higher than all other race and ethnic groups with the exception of American Indian, Non-Hispanics.

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Figure 12.5 Annual Suicide Rates, 2003–2007



Source: MDPH Death File, 2003–2007.

\*Statistically higher than other race and ethnic groups represented here ( $p \leq .05$ ).

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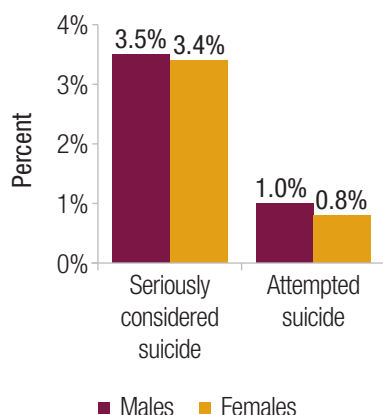
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## Suicide and Mental Illness

There is a strong association between suicide and mental illness. Studies indicate that as many as 90% of completed suicides are by men and women who have a diagnosable mental illness or substance abuse problem or both.

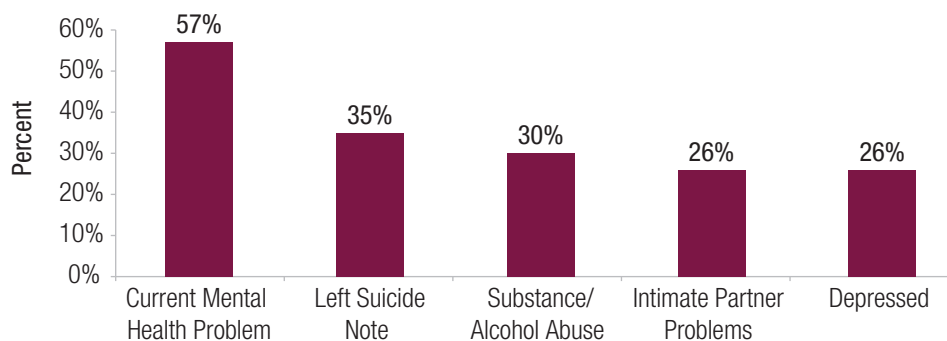
Some information on suicide circumstances is available from the MA Violent Death Reporting System, a surveillance system that collects detailed information from medical examiners, police crime labs and death certificates. This includes homicides, suicides, deaths of undetermined intent, and unintentional firearm deaths.

Figure 12.7 Suicidal Thinking and Behavior Among Adults (Ages 18+)



Sources: MDPH BRFSS, 2005-2007.

Figure 12.6 Circumstances Associated with Suicides



Source: MDPH Violent Death Reporting System.

Survey findings from the Behavioral Risk Factor Surveillance System indicate the extent of suicidal thinking and attempts reported between 2005 and 2007.

## Young People and Suicide

Despite the relative rarity of a death by suicide of a younger person (approximately 10% of the 2007 suicides were of individuals 24 or under), the tragic loss of a child, the effect of the death on schoolmates, family and friends, and the fear engendered in the community by these events heighten the impact of the death. Survey findings from the MA Youth Risk Behavior Survey, an anonymous written survey of youth in public high schools in MA, indicate that in 2007:

- 17% of high school students reported a self-inflicted injury that was not a suicide attempt;
- 13% of students seriously considered suicide during the past year, 11% made a suicide plan and 8% made an attempt;
- 24% of high school students reported feeling so sad or depressed daily for at least two weeks during the previous year that they discontinued usual activities. A significantly larger percentage of females than males reported feeling this way (31% vs. 17%).

There is a strong association between students who report having made suicide attempts and students who report experiencing dating violence, bullying and other forms of victimization.<sup>2</sup> (See Chapter 13 on Violence.)

## Geographic Differences

Suicide and Self-inflicted injuries vary slightly across the state. The rates were highest in the Western and Southeast regions and lowest in the metro West and Boston Regions.

## Suicide Prevention Strategies

The Massachusetts Department of Public Health Suicide Prevention Program works to reduce the number of suicides and suicide attempts in the Commonwealth. The program employs prevention strategies recommended by the National Suicide Prevention Plan, which include increasing public awareness of suicide as a public health problem, reducing the stigma of help-seeking, screening for depression, skills training for mental health, substance abuse and healthcare professionals, gatekeeper training for the general public and services for families and communities after a suicide occurs.

The program provides leadership, technical assistance and funding to the Massachusetts Coalition for Suicide Prevention, a broad-based alliance of suicide prevention advocates, public and private agency representatives, policy makers, suicide survivors, mental health and public health providers, and concerned citizens who work together to reduce the incidence of self-harm and suicide in the Commonwealth.

Figure 12.8 **Annual Suicide Rates by EOHHS Region, 2003-2007**

EOHHS Region	Average Annual Rate per 100,000
Western	7.6
Southeast	7.5
Central	7.4
Northeast	7.1
Metro West	5.7*
Boston Region	5.5*
Total	6.7

Source: Registry of Vital Records and Statistics, MDPH.

\*The Boston and Metro West Regions were statistically lower than the state-wide rate and other regions ( $p \leq .05$ ); they were not, however, statistically different from each other.



**Ellen Connorton, ScD, MSW, MPH**

Founder, Mass Coalition for Suicide Prevention

**T**he Massachusetts Department of Public Health Suicide Prevention Program (SPP) has worked with the Massachusetts Coalition for Suicide Prevention (MCSP) to define policy objectives towards preventing and reducing suicide and self-harm. These goals and objectives are outlined in the Massachusetts Strategic Plan for Suicide Prevention. The DPH SPP seeks to increase broad based support for suicide prevention, and maintain and promote political will and ongoing support for suicide prevention and resiliency building. To do this, we must reduce the stigma and discrimination associated with suicide and promote healthy and help-seeking behaviors, with supportive policy, regulation, and law.

### **State Structure**

We are very fortunate the Massachusetts Legislature takes a strong interest in suicide prevention, supporting efforts through line-item funding of the DPH SPP, legislation, and holding hearings on suicide prevention. We also have strong support in the state's Executive branch, in the Governor's office and through sister agencies in the Executive Office of Health and Human Services (EOHHS).

A state commission to study and implement strategies to prevent suicide and self-harm would further this work. This commission would include representation from legislative and executive branches and the private sector, work to implement objectives of the Massachusetts Strategic Plan for Suicide Prevention, and recommend policy changes to maximize prevention resources.

Suicide prevention is not the work of a single state agency. While DPH has been at the forefront of prevention efforts, along with the Department of Mental Health (DMH), suicide prevention requires that sister EOHHS agencies support policies that promote cross-agency dialogue about suicide prevention within EOHHS agencies, and throughout state government.

While suicide prevention is a young field with a limited evidence base, science continues to identify the most effective practices. Suicide prevention strategies must be grounded in the best evidence available.

Means restriction—restricting access to lethal means of suicide—is among the most evidence based and effective suicide prevention strategies. In the 1990's the Massachusetts legislature enacted stringent gun safety legislation that has contributed to our state's low rates of firearm suicide, and is a successful suicide prevention strategy that should be continued. Policies that promote further means restriction include architectural barriers on bridges, overpasses and tall structures; blister packaging of lethal medication, and reviews of train crossings can continue to reduce suicide in Massachusetts. Health and mental health providers can be trained to counsel patients and families on the risks of access to lethal means.

Disparity in access to mental health care remains a significant barrier to suicide prevention. We must support state policies that ensure equitable mental health and substance use coverage for all. We must also ensure that disparities in access to services, whether influenced by geography, language, culture (including GLBT populations) or incarceration are addressed in our prioritization of planning, policy and resources.

Because successful suicide prevention will involve a multi-disciplinary approach, those with knowledge of suicide prevention should be incorporated into state commissions targeting related issues. People with expertise in suicide prevention can be identified and made available to serve on related planning efforts. In addition, while survivors of suicide are long-standing advocates for suicide prevention, those who suffer with their own suicidal ideation aren't always included in planning efforts. Mental health consumers should also be integrated into all state commissions, and at all levels of suicide prevention planning.

The Massachusetts Strategic Plan for Suicide Prevention is designed to address statewide suicide prevention efforts with broad strategies appropriate to the whole population as well as high risk groups. It is hoped that groups associated with both populations at increased risk of suicide and coalitions addressing prevention for regions or cities and towns will use the State Plan as a starting point to develop their own population-specific, more tailored suicide prevention plans.



# FIGURE NOTES

**Figure 12.4:** Fiscal Year 2007 (October 1, 2006 - September 30, 2007).

**Figure 12.5:** The five most recent years available were combined to stabilize rates.  
Rates for American Indians were not calculated because of small numbers.

**Figure 12.6:** More than one circumstance may be noted for a suicide.  
Intimate Partner Problems refer to any problem with a current or former intimate partner and may or may not involve violence.

**Figure 12.7:** The five most recent years available were combined to stabilize rates.

**Figure 12.8:** The five most recent years available were combined to stabilize rates.



# ENDNOTES

- 1 Ialongo N, McCreary BK, Pearson JK, et.al. Suicidal behavior among urban, African American young adults. *Suicide and Life-Threatening Behavior*. September 2002;32(3): 256-271.
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# V

## Violence



Violence is a serious public health issue in Massachusetts and in the US. On average, every week in 2007 in Massachusetts, three to four people died by homicide, more than 45 spent time in the hospital, and more than 485 visited an emergency department because of an injury from an assault.<sup>1</sup>

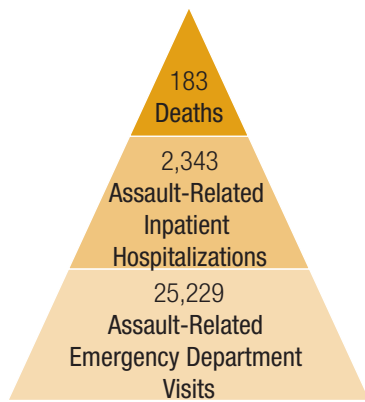
Although statistics from hospital data and death certificates are startling, they do not fully account for the problem. Sexual assaults, intimate partner violence, and child and elder abuse may be reported only sporadically. Injuries from assaults may be treated in a physician's office or health center and many assaults go unreported to medical personnel and police, even when a physical injury occurs.

Regardless of how assaults are counted, deaths and injuries are only the proverbial "tip of the iceberg" in terms of the impact of violence. The hidden effects of assaults and threats can include psychological consequences that affect quality of life, physical health, and a person's ability to function. Violence also negatively impacts society through high financial and property damage costs, reduced productivity, and a sense of fear and dread that can contribute to sedentary lifestyles and social isolation.

For many types of violence discussed in this chapter, evidence of overlap is often found. Adults who had experienced IPV were more likely to report also having been the victims of unwanted sexual contact. A similar pattern was found for dating violence victims. Children who reported witnessing family violence were more likely to report experiencing direct peer violence themselves in the forms of bullying and dating violence.

Source: MDPH BRFSS 2005-2007, MDPH Youth Health Survey 2007 and Massachusetts Department of Elementary and Secondary Education 2007 YRBS.

Figure 13.1 **Deaths and Injuries Due to Assault**



Sources: MDPH Death File, 2007; Massachusetts Division of Health Care Finance and Quality Inpatient Hospital Discharge Database, Outpatient Observation Stay Database and Outpatient Emergency Department Database, FY2007.

**The good news is that violence is preventable.**

Violence is complex: it is affected by individual, family, community, and societal factors. Although generally, males are at greater risk both to perpetrate and to be victims of violence, within some categories of violence, the probability of becoming a victim is reversed or nearly equal for females. For example, statistics from multiple sources and field observations indicate that females are disproportionately affected by intimate partner violence and the crimes of rape and sexual assault.

Violence also can occur in multiple forms to the same people. This fact has been documented in cases of family or domestic violence in which forms of child maltreatment may occur in the same household as intimate partner violence (IPV).<sup>2,3</sup> Overlap with forms of violence that occur outside of the family has also been found.<sup>4</sup> Research has shown that the risk of negative physical and mental health outcomes and of behaving in ways that put health at risk increases as the number of types of adverse experiences during childhood increases.<sup>5</sup>

The good news is that violence is preventable. The more we learn about factors that increase or reduce the likelihood of violence – known as risk and protective factors – the greater the probability of putting effective prevention strategies into place.

This chapter covers several types of violence, providing information about how common the problem is, who is most affected, mental and physical health outcomes and risks associated with violence.

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### **Bullying, Harassment, and Violence in School Settings**

Although we may think of our schools as safe places, many children experience violence in or on the way to or from school each year. In 2007, more than a quarter (28%) of high school students reported being in a physical fight on school property and 5% reported being threatened or injured with a weapon.<sup>6</sup>

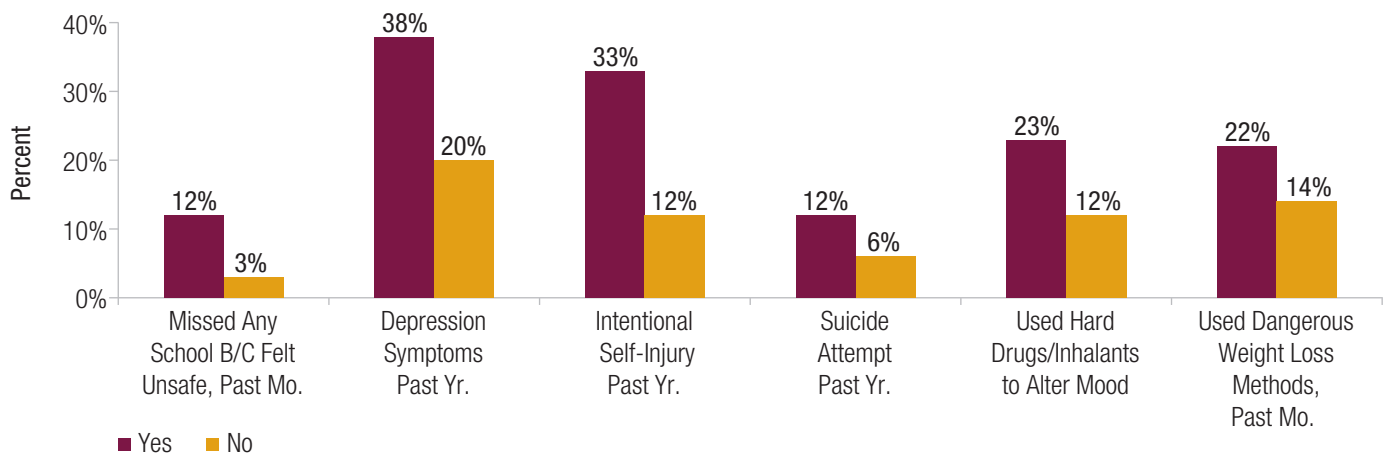
More than one in five high school students reported being bullied at school. Being bullied included being repeatedly teased, threatened, hit, kicked, shunned, or excluded by another student or group of students. Overall, 14% of high school students reported bullying others, and boys were more likely than girls to report such behavior (18% vs. 9%).<sup>6</sup>

Certain groups of students may be more likely to be bullied. Two 2007 MA surveys found that students who identified as gay, lesbian, or bisexual, or who were unsure of their sexual orientation (39% vs. 20% of heterosexual students);<sup>7</sup> students with a disability (12% vs. 3% of students who did not report a disability),<sup>8</sup> and students who had been told by a medical doctor that they had a weight problem (11% vs. 4% of those who had not been told this)<sup>8</sup> were more likely to be bullied.

Bullying has profound health and well-being consequences for young people. Massachusetts data parallel national studies that show that youth who are bullied are five times more likely to become depressed. Bullied girls are eight times more likely to be suicidal. Bullied boys are four times more likely to be suicidal.<sup>9</sup>

**Bullying has profound health and well-being consequences for young people.**

Figure 13.2 High School Students Bullied in Past Year: School Attendance and Emotional/Mental Health



Source: Massachusetts Department of Elementary and Secondary Education YRBS, 2007. All comparisons are statistically significant ( $p \leq .05$ ).

Bullying can be an early warning sign of anti-social behavior that may occur in other settings and continue into adulthood. National data show that nearly 60% of those classified by researchers as bullies in grades six through nine were convicted of at least one crime by age 24. Forty percent had three or more convictions by age 24.<sup>9</sup>

**Community Violence**

Community violence affects everyone to the degree that it directly touches their lives and limits freedom of movement by making some places too dangerous to visit. For those who must live in or near places where violent crime is very common, the daily risks can take a toll on physical and emotional health.

Community violence can directly affect the outlook of children and young people who may be either victims or witnesses of crime, and it can result in an increased risk of injury, developmental disorders, youth crime, post-traumatic stress disorder (PTSD), and a number of other anxiety disorders.<sup>10,11,12</sup>

Although community violence affects everyone to some degree, it affects young males most, particularly young males of color.

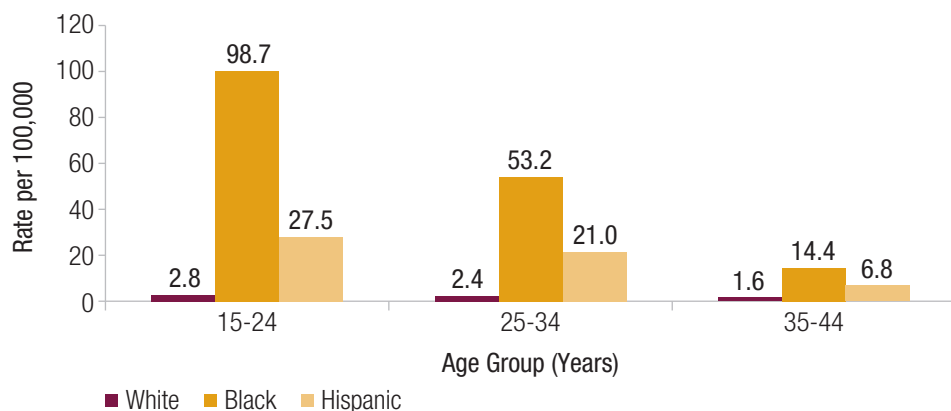
Patterns of non-fatal, assault-related injuries are similar to patterns of assault-related deaths, with the highest rates occurring among the 15-24

In 2007, young Black males (ages 15-24) were 38 times more likely to die by homicide than young White males, and young Hispanic males were 15 times more likely to die by homicide than young White males.

Source: MDPH Violent Death Reporting System, 2007.  
Note: These homicides exclude IPV/jealousy-motivated homicides and homicides where the suspect was a family member.



Figure 13.3 Homicides Among Males

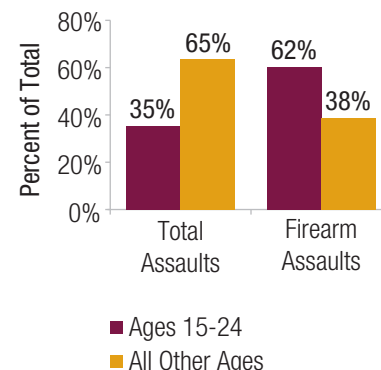


Source: MDPH Violent Death Reporting System, 2003-2007 (combined).

\*The rate for Black males 15-24 was significantly higher than White and Hispanic males in this age group ( $p \leq .05$ ). The rate for Hispanic males 15-24 was significantly higher than White males in this age group ( $p \leq .05$ ).

Rate calculated on counts less than 20 may be unstable and should be interpreted with caution.

Figure 13.4 Nonfatal Assault-Related and Assault-Related Firearm Injuries

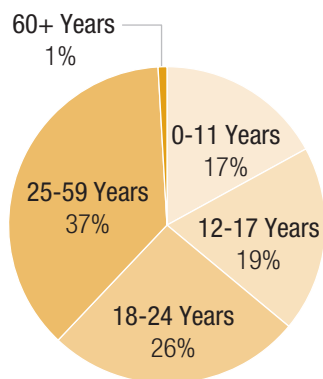


Source: Massachusetts Division of Health Care Finance and Policy, Hospital Discharge Database, 2007.

Survivors reported to the Massachusetts Rape Crisis Centers that current or ex-spouses, partners, dates, boyfriends, or girlfriends committed 26% of rapes/sexual assaults, followed by friends and acquaintances (25%), parents, step-parents, siblings, or other relatives (20%). Strangers accounted for only 14%, and persons known for less than 24 hours for only 6% of these incidents.

Source: MDPH, Rape Crisis Centers Program Data, FY2007.

Figure 13.5 Age of Sexual Assault/Rape Survivor at Time of Assault



Source: MDPH Rape Crisis Centers Program Data, FY2007.

year-old age group, followed by the 25-34 year old age group. More than a quarter (27.6%) of the assault-related injuries in the 15-24 age group during 2007 were firearm-related.<sup>13</sup>

## Rape and Sexual Violence

The term 'sexual violence' is used broadly to describe sexually violent and abusive behaviors that include but are not limited to rape, sexual assault, drug- or alcohol-facilitated sexual assault, and sexual harassment and exploitation. Most rapes and sexual assaults are committed by persons known to the victim.

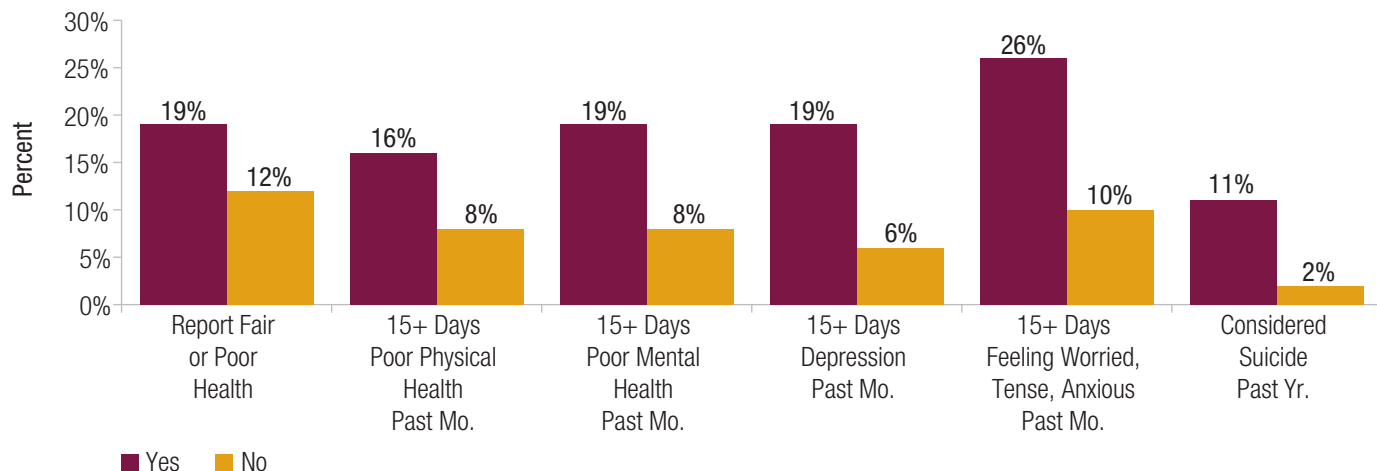
According to the FBI's Uniform Crime Reports, there were 1,634 forcible sexual assaults reported in MA in 2007.<sup>14</sup> The BRFSS reveals that 11% of MA adult residents reported having experienced some form of sexual violence in their lifetimes.<sup>15</sup>

Women (15%) were more likely than men (6%) to have reported such experiences.<sup>16</sup> Similarly, 18% of high school girls and 7% of high school boys reported having experienced some form of sexual violence in their lifetimes.<sup>7</sup> This type of gender disparity has been found repeatedly over time in international, national, state, and local surveys. Other groups who may be at higher risk for sexual violence include those with disabilities (22% of adults with disabilities versus 9% of adults who did not report a disability), and those who identify with a sexual orientation other than heterosexual (29% compared to 12% of heterosexual adults).<sup>17</sup>

Rape and sexual assault have short- and long-term effects on victims' physical and mental health. Three-year average BRFSS statistics (2005-2007)



Figure 13.6 Sexual Assault and Physical and Mental Health, Persons 18+



Source: MDPH BRFSS, 2005-2007.

\*All comparisons are statistically significant ( $p \leq .05$ ).

show that adults who have experienced a rape or sexual assault sometime in their lifetimes are more likely than adults without such experiences to also experience physical health symptoms, depression, suicidal thoughts, and other mental health symptoms.<sup>17</sup>

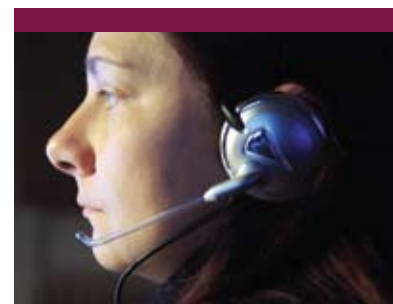
Teens who had experienced sexual assault were also more likely than those who had not to do poorly in school; miss school due to feeling unsafe on the way to, from, or in school; experience symptoms of depression; purposely injure themselves; have considered or attempted suicide in the past year, been or gotten someone pregnant in the past year; and driven after drinking.<sup>7</sup>

### Intimate Partner Violence: Dating and Domestic Violence

Intimate partner violence (IPV), often called domestic violence, is behavior that physically hurts, arouses fear, or prevents a victim from doing what he/she wishes. It involves a pattern of coercive control directed toward the victim that is intended to undermine the will of the victim and to substitute the will of the perpetrator. IPV occurs in same-sex and heterosexual relationships.

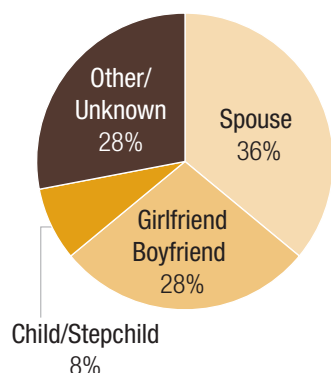
In 2005, 18% of MA adult residents reported having experienced an incident of IPV at some time in their lives.<sup>19</sup> Women (22%) were more likely than men (14%) to have reported such experiences.<sup>20</sup> Intimate partner violence also affects youth. Eleven percent of high school students and six percent of middle school students reported being physically hurt by a date sometime in their lives.<sup>6</sup>

As with sexual violence, a higher percentage of adults with a disability reported having experienced IPV at some time in their lives than adults



Between fiscal year 2002 and fiscal year 2007, there were an average of 12,550 calls each year to the Massachusetts Rape Crisis Centers (RCCs) and the Spanish-language hotline service, *Llamanos y Hablemos*. RCCs also provide individual and group counseling and advocacy services for survivors, and accompany survivors to hospitals and medical clinics for medical intervention after an assault. In FY2007 Massachusetts RCCs provided 810 medical advocacy sessions to 736 individuals who sought medical services in relation to a sexual assault.<sup>18</sup>

Figure 13.7 **Victim-Suspect Relationship in Intimate Partner Violence Homicides**



Source: MDPH Violent Death Reporting System, 2003-2007.

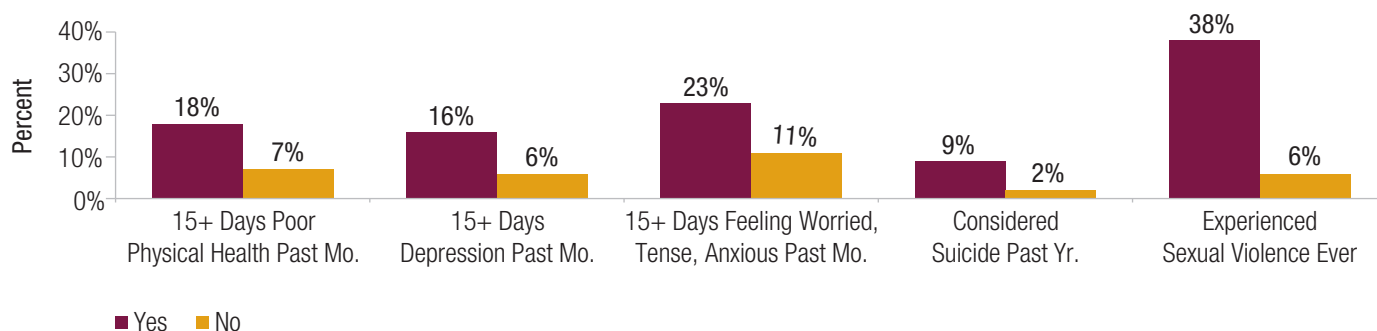
with no disability (30% vs.15%), and, 47% of gay, lesbian, and bisexual adults reported such experiences compared to 19% of heterosexual adults.<sup>19</sup>

At its most extreme, IPV can lead to death. Between 2003 and 2007, 125 IPV-related homicides were recorded statewide.<sup>21</sup> Although the IPV victim is most often the target of IPV homicide, other people close to the IPV victim, including one or more children, may be killed as well or instead.<sup>21</sup>

Historically, many homicide-suicides happen as part of IPV dynamics. Between 2003 and 2007, more than 80% of the 41 homicide-suicide cases in Massachusetts were IPV/jealousy-motivated. These homicide-suicides took the lives of 70 people.<sup>21</sup>

In addition to the increased risk of injury and death, victims of IPV experience a variety of increased health risks.

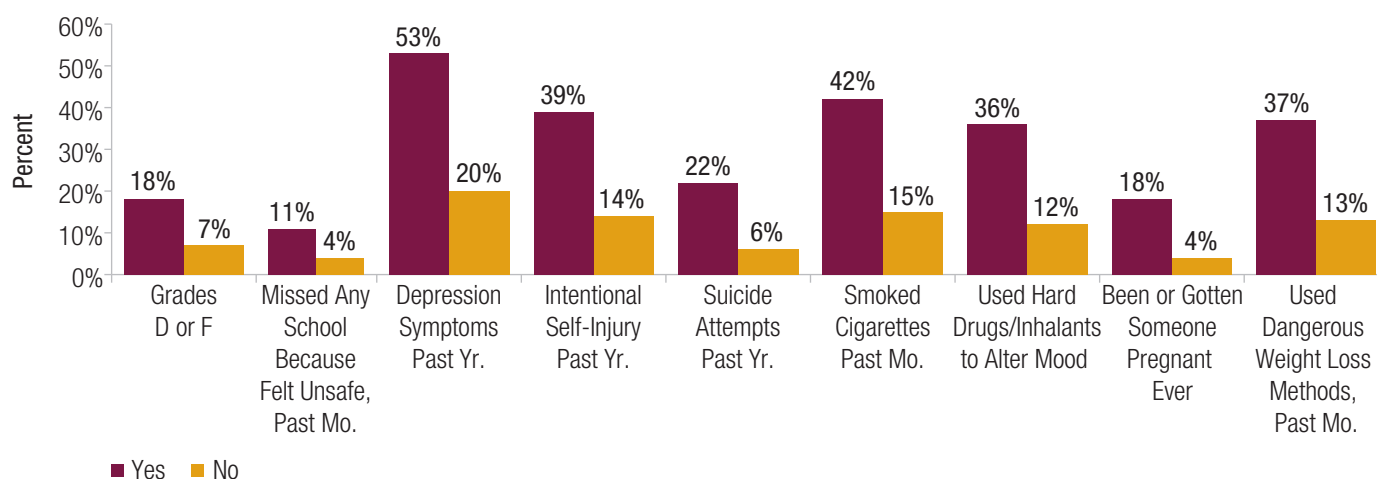
Figure 13.8 **Experienced IPV: Emotional/Mental Health and Sexual Violence Victimization History**



Source: MDPH BRFSS, 2005.

\*All comparisons are statistically significant ( $p \leq .05$ ).

Figure 13.9 **Dating Violence, High School Students: School Attendance, Emotional/Mental Health and Risk Behaviors**



Source: Massachusetts Department of Elementary and Secondary Education YRBS, 2007.

\*All comparisons are statistically significant ( $p \leq .05$ ).

Like adults, teens who experience dating violence report a variety of risk-taking behaviors and mental and emotional states that might negatively affect their long-term health and put them in danger of injury or death.<sup>7</sup>

### Child Maltreatment and Witnessing Family Violence

Violence against infants and children is most often perpetrated by parents, or other family members. Child victims of sexual violence, are usually the victims of either family members or authority figures in child-serving or community organizations. Eighty four percent of perpetrators of child-directed sexual violence are male.<sup>23</sup>

Children are also harmed by witnessing violence in the home, as bystanders to bullying and harassment in schools and communities and as witnesses to violent crime. Effects on children range from death or injury to long-range psychological harm and health risks.

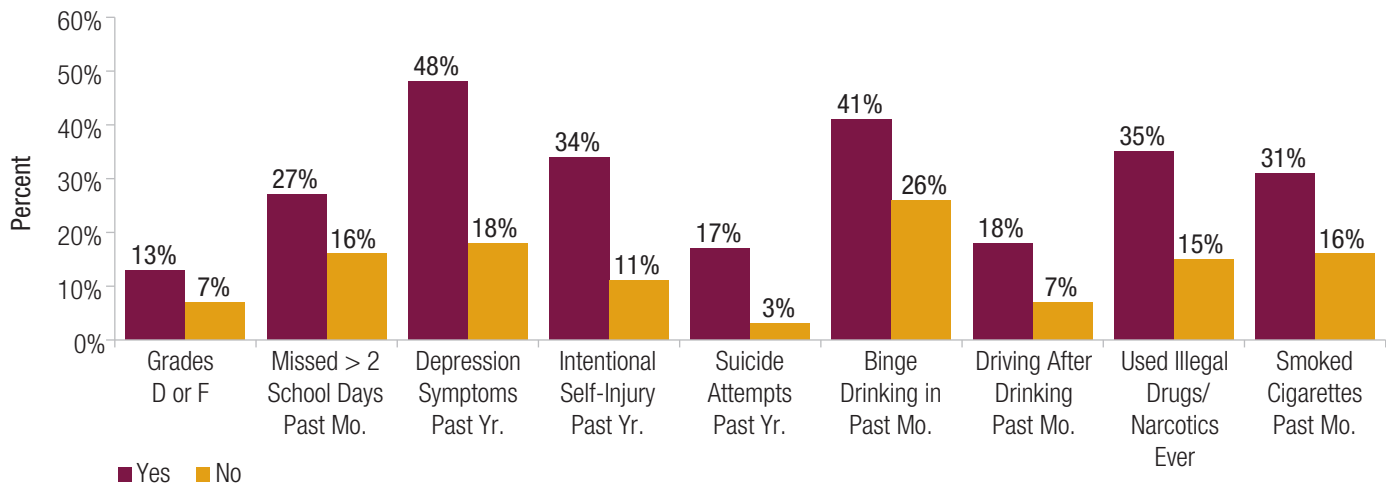
In 2007, 11% of MA high school students reported witnessing violence in their families in the past year. Certain students were more likely than others to report such experiences, including: female students (14% vs. 9% of male students); students who identified as Hispanic or with a race other than White (16% vs. 9% of White students); students who identified as gay, lesbian, or bisexual (28% vs. 10% of heterosexual students), and students who reported a disability (18% vs. 8% of students without a disability).<sup>8</sup>

Students who reported witnessing family violence in the past year were doing more poorly than students who did not on a variety of measures of school performance, mental health, and general distress. They were also

Approximately 2,200 people attended Massachusetts Certified Batterer Intervention Programs each year between fiscal years 2003 and 2007.<sup>24</sup> Over a six-year period, IPV offenders who completed MA certified batterer intervention programs were less likely than those who did not to have a subsequent arraignment of any kind (47.7% vs. 83.6%), an arraignment for a subsequent violent offense (33.7% vs. 64.2%), or one for a subsequent restraining order violation (17.4% vs. 41.8%). Those who completed batterer intervention programs also had lower new arraignment rates than IPV offenders who completed anger management or substance abuse treatment. Other types of programs studied did not decrease IPV offenders likelihood to have additional restraining order violations or arraignments.

Source: Office of the Commissioner of Probation's 2004 study *Restraining Order Violators, Corrective Programming, and Recidivism*.<sup>22</sup>

Figure 13.10 Witnessing Family Violence, High School Students: School Attendance, Emotional Distress and Risk Behaviors



Source: MDPH Youth Health Survey, 2007.  
•All comparisons are statistically significant ( $p \leq .05$ ).

**Since 2000, more than 33,500 reports of child maltreatment have been supported by the Department of Children and Families each year.<sup>23</sup>**

more likely than their peers to have engaged in risky behaviors that could affect their safety or their long-term health.<sup>8</sup>

Since 2000, more than 33,500 reports of child maltreatment have been supported by the Department of Children and Families (DCF) each year.<sup>23</sup> In 2007, DCF labeled as supported 853 cases of child sexual abuse and 4,593 cases of child physical abuse.<sup>23</sup> These numbers do not represent all of these types of abuse, since not all incidents are reported to DCF. There are also obstacles to confirming such reports, particularly of the sexual abuse of young children.<sup>23</sup>

# FIGURE NOTES

**Figure 13.3:** Homicides exclude intimate partner violence and jealousy-motivated homicides and homicides where the suspect was a family member. Rate calculated on counts less than 20 may be unstable and should be interpreted with caution; counts of less than 20 include ages 0-14 for *all* race and ethnicities, Black residents ages 45+, Hispanic residents ages 35-44, 45+ and all Asian age groups.

**Figure 13.4:** Data shown are injuries requiring hospitalization. Residents ages 15-24 years accounted for 34.7% of total nonfatal assault-related injury hospital discharges, but 61.7% of all firearm assaults in 2007.

**Figure 13.7:** “Other” may include people like the IPV victim's family members, a new boyfriend, girlfriend, or spouse, friend, or a colleague.

**Figure 13.8:** Reports based on lifetime experience.

# END NOTES

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- 13 Massachusetts Hospital Discharge Database, Division of Health Care Finance and Policy, 2007.
- 14 US Department of Justice, Federal Bureau of Investigation. FBI Uniform Crime Reports: *Crime in the United States, 2007, Table 5: Crime in the United States by State, 2007*, September 2008.
- 15 Overall percentage is a previously unpublished statistic from the 2007 Massachusetts Behavioral Risk Factor Surveillance System, which is administered via the Health Survey Program, Bureau of Health Information, Statistics, Research, and Evaluation, MDPH.



- 16 MDPH, Bureau of Health Information, Statistics, Research, and Evaluation, Health Survey Program. *A Profile of Health among Massachusetts Adults, 2007*, December 2008.
- 17 Previously unpublished statistics from combined 2005 through 2007 Massachusetts Behavioral Risk Factor Surveillance System data sets. The MA BRFSS is administered via the Health Survey Program, Bureau of Health Information, Statistics, Research, and Evaluation, MDPH.
- 18 MDPH, Bureau of Community Health Access and Promotion, Division of Violence and Injury Prevention, Sexual Assault Prevention and Survivor Services data sets.
- 19 Previously unpublished statistics from the 2005 Massachusetts Behavioral Risk Factor Surveillance System, which is administered via the Health Survey Program, Bureau of Health Information, Statistics, Research, and Evaluation, MDPH.
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# Mortality



With advances in health care, nutrition, public health and other factors, the death rate in Massachusetts and in the US has steadily decreased in the past century. In 2007, approximately one of every 120 Massachusetts residents died. One hundred sixty-one years ago, in 1849, it was one out of every 47 residents.

Massachusetts was the first state to mandate the registration of vital statistics – births and deaths – in 1841.

Causes of death, as well as age, race, gender, educational attainment, marital status, and occupation are collected on the death certificate.

The Department of Public Health uses this information to monitor long-term mortality trends in the Commonwealth, identify groups at greatest risk of death from diseases and injuries, and design and implement programs directed toward these groups.

In order to understand the impact of mortality, both the number of deaths and death rates are important. The number of deaths provides insight into the overall public health burden of specific diseases.

**In 2007, approximately one of every 120 Massachusetts residents died. One hundred sixty years ago, in 1849, that rate was one death for every 47 residents.**

The mortality rates presented in this chapter are age-adjusted.<sup>1</sup> This removes much of the effect of differences in the age distribution when comparing different population groups over time. Mortality rates are presented per 100,000 population.

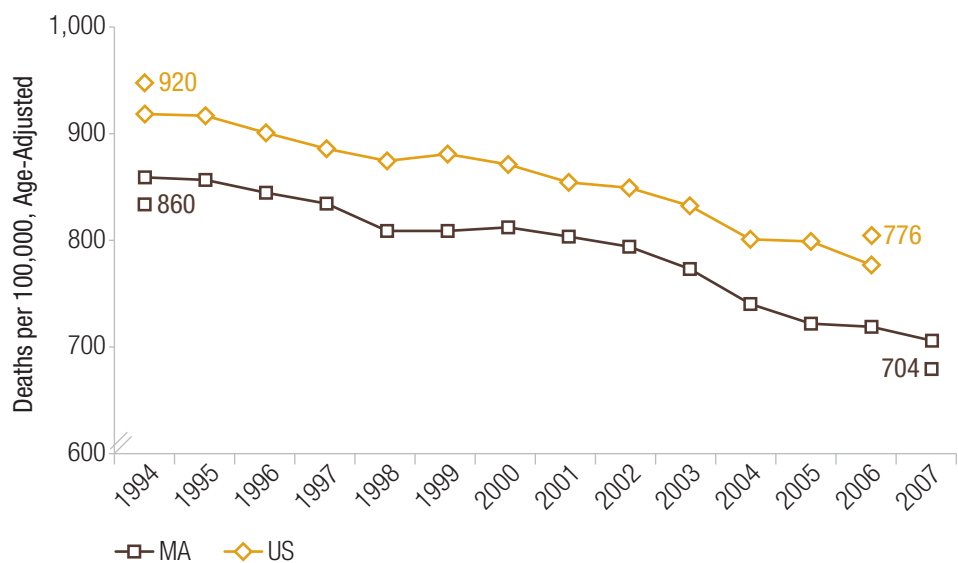
In addition to risk factors traditionally considered when assessing mortality, variations in death rates may also reflect differences in socio-economic status, access to health care, geography, and other factors.

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## Overall Mortality

The overall death rate in Massachusetts reached a record low of 704 deaths per 100,000 population in 2007. This compares favorably with the US death rate of 776 per 100,000<sup>2</sup> (Figure 14.1). Massachusetts death rates have consistently been lower than the US as a whole.

Figure 14.1 Overall Mortality Rates



Source: MDPH Death File, 2007.

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## Racial and Ethnic Differences

Rates also vary greatly by race and ethnicity, a trend that has been present over time. Blacks have the highest death rate, which is 1.2 times the death rate of Whites, while the rate for Asians continues to be the lowest for all groups.

However, the actual death rates for both Asians and Hispanics may be higher than these rates, and caution is advised when interpreting mortality data for groups with small populations. National studies have shown that Hispanics, Asians and Native Americans may be undercounted in the

Census and misclassified on death certificates which may also result in artificially low mortality rates.<sup>3,4,5</sup>

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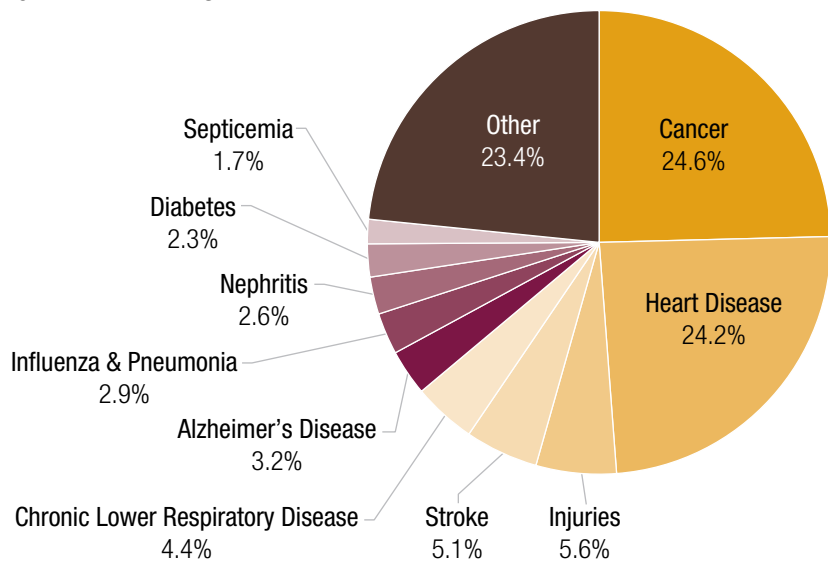
**Leading Causes of Death**

Ranking the leading causes of death is a useful tool for illustrating the relative burden of cause-specific mortality. Leading causes of death are ranked according to their number, rather than their mortality rate.<sup>6</sup>

Cancer and heart disease account for nearly half of all deaths in 2007, and the top ten leading causes of death account for 75% of deaths. Out of every 100 deaths, 25 are due to cancer, 24 to heart disease, 17 to other chronic diseases, 7 to injuries, and 5 to infections (Figure 14.2).

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Figure 14.2 **Leading Causes of Death**



Source: MDPH Death File, 2007.

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Leading causes of death also differ by age. In 2007, as in previous years, injuries are the leading cause of death for persons between the ages of 1 to 44, while in older age groups, chronic diseases such as cancer and heart disease are the leading causes of death (Figure 14.3).

In 2007, the two leading causes of death are cancer and heart disease for all race and ethnicity groups. Yet, there are some variations in other leading causes of death according to race and ethnicity.

For example, Alzheimer's disease is among the top 10 leading causes of death only for Whites, and HIV/AIDS is among the top 10 only for Blacks and Hispanics while it ranks 29<sup>th</sup> for Whites. Homicide is the 7<sup>th</sup> leading cause of death for Blacks and Hispanics, while it is the 30<sup>th</sup> for Whites and 21<sup>st</sup> for Asians (Figure 14.4).

Figure 14.3 Leading Causes of Death by Age

Rank	Age Groups (Number of Deaths)						All Ages
	<1 year	1-14 years	15-24 years	25-44 years	45-64 years	65-74 years	
1	Short Gestation (80)	Unintentional Injuries (20)	Unintentional Injuries (234)	Unintentional Injuries (587)	Cancer (3,149)	Heart Disease (10,798)	Cancer (12,961)
2	Congenital Malformations (63)	Cancer (18)	Homicide (73)	Cancer (317)	Heart Disease (1,655)	Cancer (9,439)	Heart Disease (12,735)
3	SIDS (31)	Homicide (16)	Suicide (50)	Heart Disease (246)	Unintentional Injuries (565)	Stroke (2,475)	Stroke (2,710)
4	Pregnancy Complications (26)	Congenital Malformations (12)	Cancer (35)	Suicide (193)	Chronic Liver Disease (337)	Chronic Lower Respiratory Disease (2,073)	Chronic Lower Respiratory Disease (2,325)
5	Complications of Placenta (20)	Ill-Defined Conditions (9)	Heart Disease (23)	Homicide (64)	Diabetes (249)	Nephritis (1,212)	Unintentional Injuries (2,113)
<b>Total Deaths (Any Cause)</b>	380	124	505	2,023	8,560	41,091	52,690

Source: MDPH Death File, 2007.

Figure 14.4 Rank of Leading Causes of Death by Race and Ethnicity

	White (N=48,518)	Black (N=2,211)	Asian (N=610)	Hispanic (N=1,264)	American Indian (N=40)
<b>Leading Cause</b>					
Cancer	1	1	1	1	2
Heart Disease	2	2	2	2	1
Stroke	3	6	3	5	—
Chronic Lower Respiratory Disease	4	9	6	16	—
Unintentional Injuries	5	5	5	3	—
Alzheimer's Disease	6	14	14	15	—
Influenza & Pneumonia	7	15	4	17	—
Nephritis	8	3	8	9	—
Diabetes	9	4	7	4	—
HIV/AIDS	29	8	—	8	—
Homicide	30	7	21	7	—

Source: MDPH Death File, 2007.

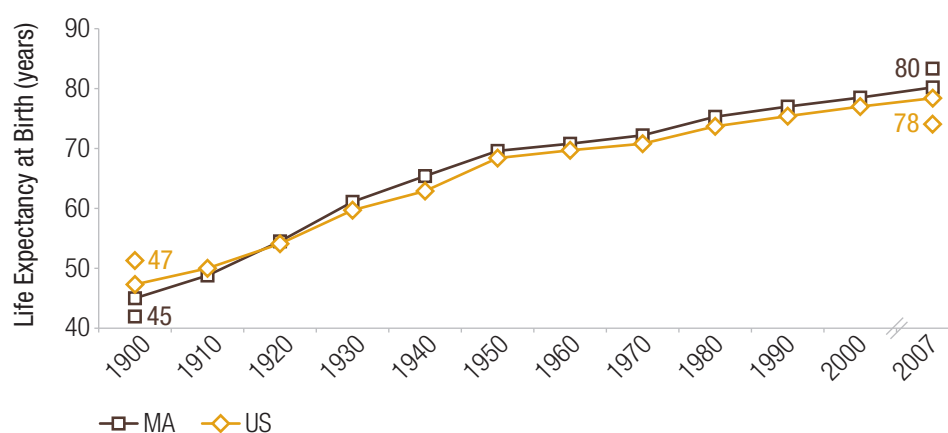


## Life Expectancy

One of the most commonly used measures of the health status of a population is life expectancy. This is expressed as the expected number of years of life at a given age.<sup>7</sup>

Overall, life expectancy reached an all-time high of 80 years in 2007. This means that on average, a person born in Massachusetts in 2007 could expect to live 35 more years than a person born in 1900, when life expectancy was 45 years. Massachusetts life expectancy has been higher than US life expectancy since 1920 (Figure 14.5).

Figure 14.5 Life Expectancy at Birth



Source: MDPH Death File, 2007.

Women of all races live longer than men. For those born in 2007, White women could expect to live 83 years; Black women, 80 years; Hispanic women, 91 years; White men, 78 years; Black men 74 years; and Hispanic men, 83 years. Men who reach age 65 have an additional 18 years life expectancy, while women who reach 65 can expect 21 additional years.<sup>8</sup>

## Educational Attainment

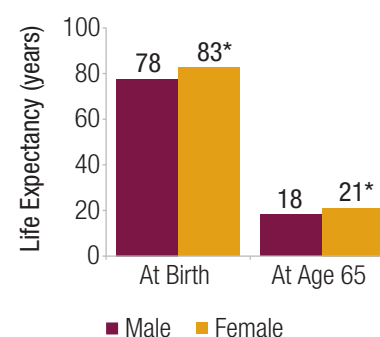
Overall, people with more education have lower death rates. The death rate for those with a high school education or less is almost 3 times higher than the rate for those who have more than a high school education. This is true for each race and ethnicity group.

However, among the more educated, there is enormous variation by race: the rate for more educated Blacks is twice as high as the rate for more educated Whites (359 vs. 181 deaths per 100,000) (Figure 14.7).

## Massachusetts life expectancy

reached an all-time high of 80 years in 2007.

Figure 14.6 Life Expectancy

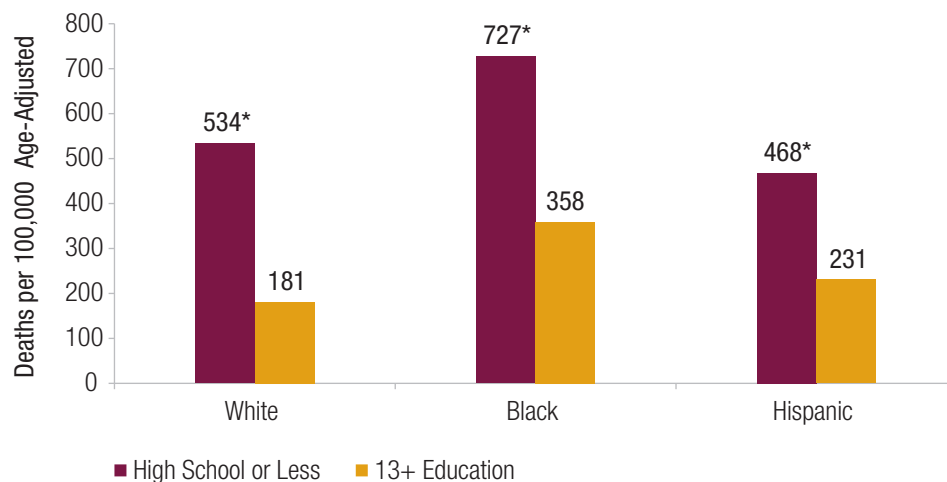


Source: MDPH Death File, 2007.

\*Statistically higher than men ( $p \leq 0.05$ ).

Figure 14.7 **Mortality Rates, Ages 25-64 Years**

Among the more educated, there is enormous variation in death rates by race and ethnicity.



Source: MDPH Death File, 2007.

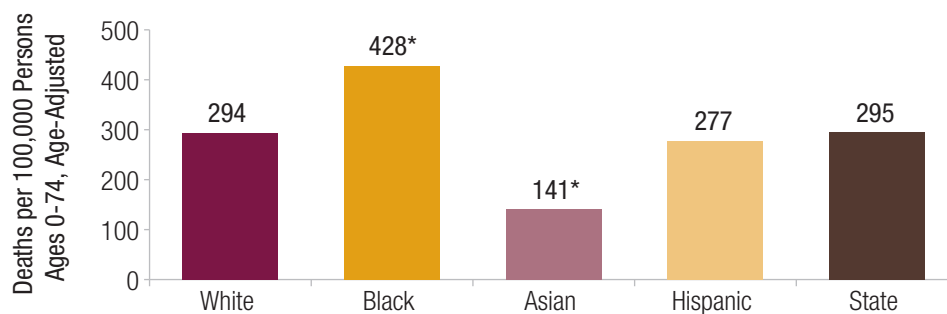
\*Statistically higher than those with 13+ yrs of education ( $p \leq 0.05$ ).

## Premature Mortality Rate (PMR)

The Premature Mortality Rate (PMR) tells us how many people die before reaching age 75. Though strictly a mortality measure, the premature mortality rate is highly correlated with morbidity indicators (measures of 'sickness' rather than death).<sup>9</sup> Areas where the populations have higher premature mortality rates tend to report poorer general health status, more chronic diseases, and more illness.

The PMR is considered an excellent single measure that reflects the health status of a population, and the need for systematic public health approaches to health promotion and disease prevention. It can help communities identify priority health concerns.

Figure 14.8 **Premature Mortality Rates**



Source: MDPH Death File, 2007.

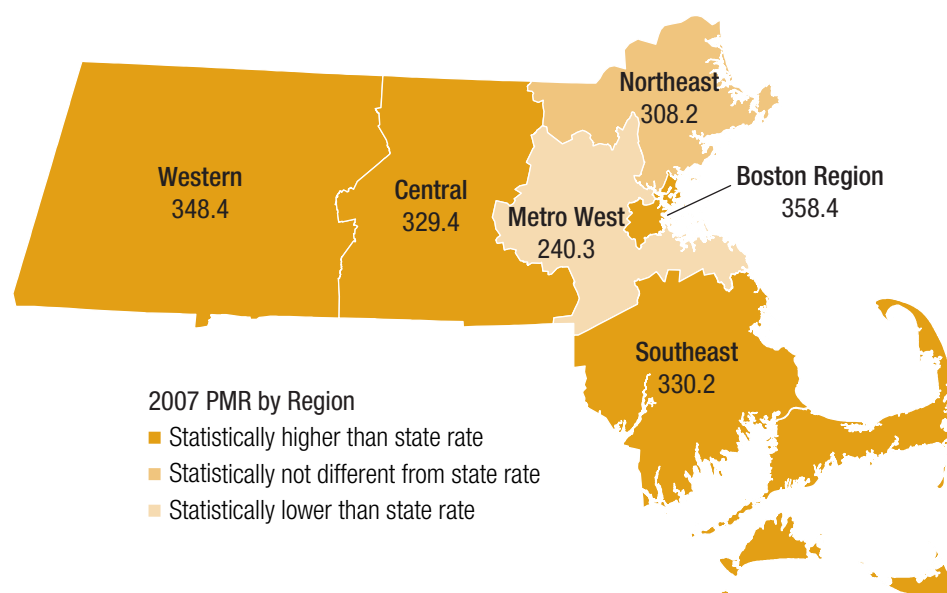
\*Statistically different from state ( $p \leq 0.05$ ).

In 2007, the state PMR is 295 deaths per 100,000 persons under age 75 years. Blacks have the highest PMR, experiencing 1.5 times the rate of premature deaths as Whites, while Asians had the lowest PMR (Figure 14.8).

The regions with the highest PMR are the Boston and the Western regions of the state, while the lowest PMR occurs in Metro West (Figure 14.9).

In the Boston Region, the communities with the highest PMR are Chelsea, Revere and Boston. In the Western Region, the communities with the highest PMR are Springfield, Northampton, Holyoke, Agawam, Westfield, West Springfield, Pittsfield and Chicopee.

Figure 14.9 **Map of Premature Mortality by EOHHS Regions**



Source: MDPH Death File, 2007.

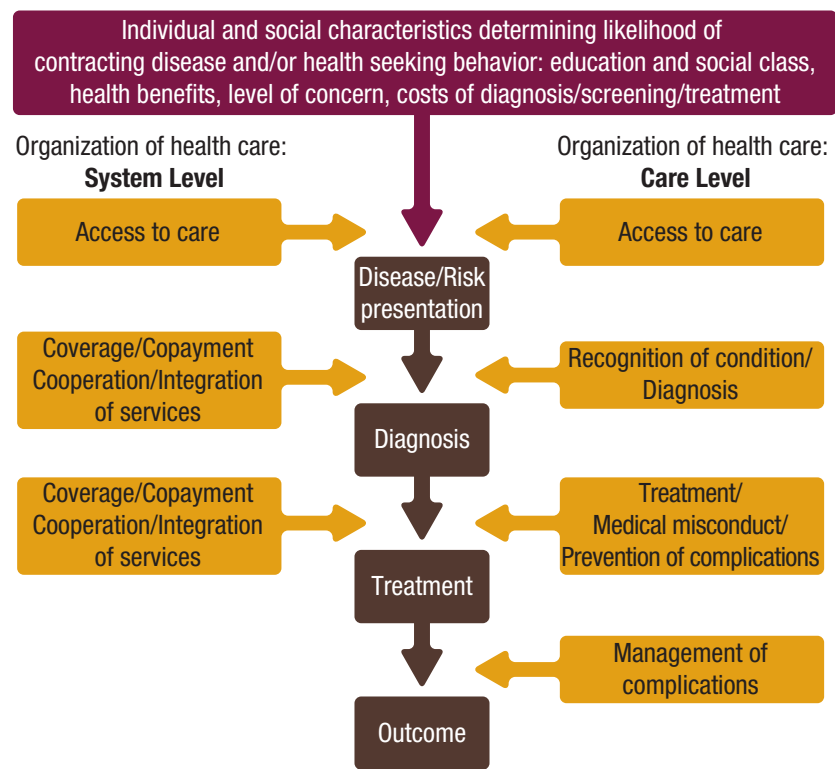
Premature mortality is inversely associated with socioeconomic indicators. Regions with the highest premature mortality rates – Boston and the Western Region – also have the highest proportion of its population with less than a high school education according to the 2000 Census. Accordingly, the region with the lowest PMR – Metro West – has the lowest proportion of its population with less than a high school education in 2000.

## Amenable Mortality

Certain causes of premature deaths (deaths before age 75), are referred to as “amenable”, that is, they may not have occurred in the presence of timely and effective health care. This concept was developed in the 1970s in the United

States and has been implemented by many countries as a tool to track changes over time and assess the performance of health care systems.<sup>10</sup> Figure 14.10 shows how timely access to health care and treatment at different stages can reduce the number of deaths for certain diseases.

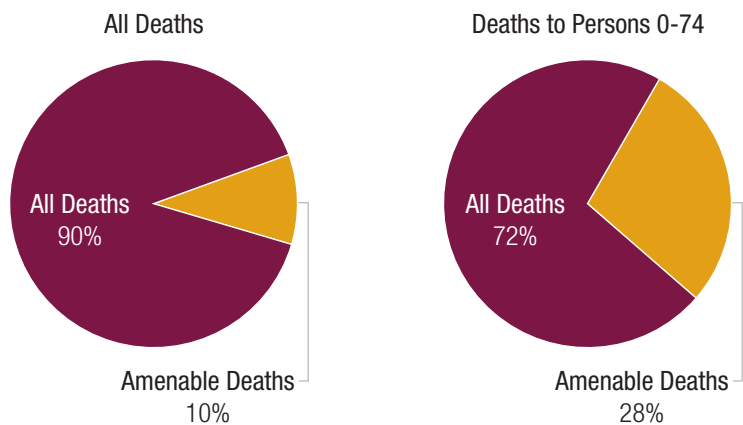
Figure 14.10 Mortality Amenable to Health Care



Amenable mortality helps identify areas where there is room for improvement in access, quality, efficiency and equity in the delivery of health care.

Source: Nolte E, McKee CM. Does Health Care Save Lives? Avoidable Mortality Revisited. London, England: The Nullfield Trust; 2004.

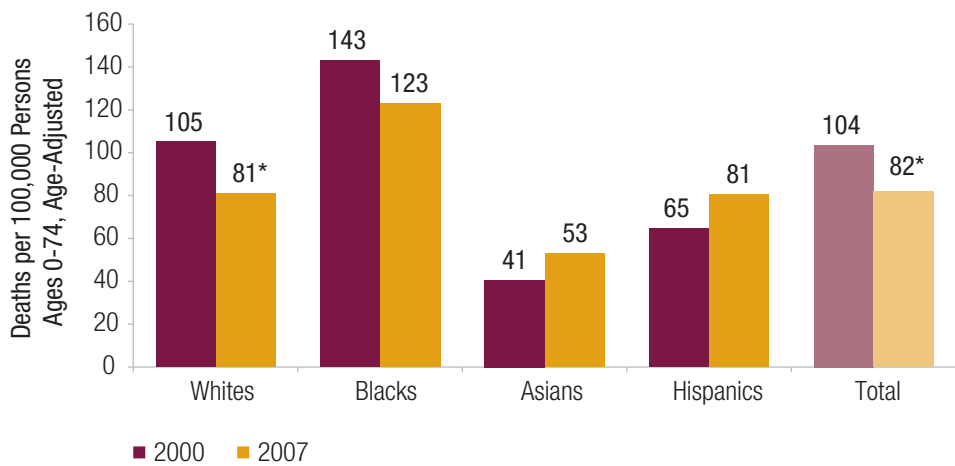
Figure 14.11 Percent Deaths Amenable to Health Care



Source: MDPH Death File, 2007.

In 2007, deaths amenable to health care account for 10% of deaths overall. However, they also account for 28% of all premature deaths (Figure 14.11). Since 2000, amenable mortality has declined among Whites and among males and females overall, but there were no statistically significant declines for Blacks or Hispanics (Figure 14.12).

Figure 14.12 **Amenable Mortality by Race and Ethnicity**



Source: MDPH Death File, 2007. Paper presented at: Public Health Council Meeting; April 2009; Boston, MA.  
\*Statistically different from 2000 ( $p \leq 0.05$ ).

### Summary

In 2007, Massachusetts mortality continues to compare favorably with the US and there are continued declines in many of the leading causes of death. Yet, disparities persist by age, gender, race, ethnicity, geography, and education.

Premature mortality and amenable mortality are frameworks that have been developed to enhance the utility of mortality data. An attractive feature of these frameworks is that they move away from considering single causes or single risk factors of death to taking a broader community perspective.

Premature mortality may be related to socioeconomic status, and its correlates, such as environmental conditions, housing, education, and stress, higher rates of smoking, substance abuse, violence, obesity, and lack of access to care.

Amenable mortality is a useful tool to begin discussions that allow policy makers, community advocates, and public health professionals, to consider more effective and cost efficient approaches to improving the quality of life and health of the public.

With the implementation of health care reform, amenable mortality may be a useful measure to examine the impact of increased access to medical care.

# FIGURE NOTES

**Figure 14.1:** Please note that 2007 US data was not available at the time of this release, 2006 US data used.

**Figure 14.4:** (–) indicates number of deaths was less than 5.

**Figure 14.5 & Figure 14.6:** Years of Life Remaining calculated using the Greville Abridged Life and Table Method. Source: Dublin LI. Length of Life – A Study of the Life Table. Ronald Press Co. New York.

**Figure 14.7:** Note that 2000 denominator figures are used since these are the latest number available for population by age and education. Following NCHS presentation of mortality data by education, rates are shown only for ages 25-64 years because persons under age 25 may not have completed their education.

**Figure 14.9:** Note that PMR for EOHHS Regions are calculated using MDPH population estimates for 2005, which are the most-up-to-date information available on the number of persons by age, race, and sex at the sub-state level. PMR are age-adjusted to the 2000 US Standard Population for persons ages 0-74 years.



# ENDNOTES

- 1 Also called age standardization, is a technique used to better allow populations to be compared when the age profiles of the populations are quite different.
- 2 Massachusetts Department of Public Health. *Massachusetts Deaths 2007*. Boston, MA; 2009.
- 3 Rosenberg HM, Maurer JD, Sorlie PD, et al. Quality of death rates by race and Hispanic origin: A summary of current research, 1999. *Vital and Health Statistics*. 1999; 2(128):1-13.
- 4 Arias E. Quality of race and Hispanic origin reporting on death certificates in the United States. Paper presented at: 2004 NCHS Data Users Conference; July 14, 2004; Washington, DC.
- 5 Sorlie, P. D., Rogot, E., Johnson, N. J. Validity of the Death Certificate. *Epidemiology*. 1992; 3(2): 181-184.
- 6 The National Center for Health Statistics (NCHS) publishes a list of 113 selected causes of death from which we select 57 causes and order them by their number of deaths.
- 7 Years of Life Remaining calculated using the Greville Abridged Life Table Method Dublin Li. Length of Life – A Study of the Life Table. New York, NY: Ronal Press Co;1949.
- 8 Please note that another potential ramification of the undercount and misclassification of deaths among Asians, Native Americans, and Hispanics, discussed previously is that Hispanics showed an exceptionally high life expectancy. Hispanics are expected to have a shorter life span, since they are more likely to have characteristics, such as low educational attainment and living in poverty, which are associated with adverse health outcomes. The method of calculating life expectancy here does not count younger deaths as heavily.
- 9 Black C, Roos NP, Fransoo R, Martens PJ. *Comparative Indicators of Population Health and Health Care use for Manitoba's Regional Health Authorities: A POPULIS Project*. Winnipeg, Manitoba: Manitoba Centre for Health Policy and Evaluation; 1999.
- 10 Nolte E and McKee CM. Measuring The Health of Nations: Updating An Earlier Analysis. *Health Affairs*; 2008; 27(1): 58-71.

# Data Sources

*Health of Massachusetts* uses the most current data available at the time of release on the health of the population of Massachusetts. Information was obtained from data files and published reports administered or compiled by the Massachusetts Department of Public Health, the federal government, other state agencies and private organizations.

In each case, the sponsoring agency or organization collected data using its own methods and procedures. Therefore, data in this report may vary considerably with respect to source, method of collection, definitions, and reference period. If you have questions about any of these items, a hyperlink to more information is included for most data sources.

The following data sources are organized by these three categories:

- Massachusetts Department of Public Health
- Federal Governmental Agencies
- Other Massachusetts State Agencies

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## How to Get More Data

### MassCHIP, Public Health Information Online

MassCHIP – the Massachusetts Community Health Information Profile – is a dynamic, user-friendly information service that provides free, online access data. MassCHIP allows users to ‘run their own’ data reports or get access to hundreds of already generated reports. Users of MassCHIP have access to 36 major data sets, including many of the data sources listed in this section.

[www.mass.gov/dph/masschip](http://www.mass.gov/dph/masschip)

### Publications from the Massachusetts Department of Public Health

The Department of Public Health annually publishes dozens of data reports, presentations fact sheets and bulletins with in-depth information on selected topics. For example, every year separate reports devoted to birth, death, cancer, occupational health, substance abuse and the Behavioral Risk Factor Surveillance System are released and available on our website. In addition to these annual reports, the Department publishes current information as it becomes available, such as H1N1 flu

information, and new one-time reports on special topics, such as the Report on Native American Health in Massachusetts.

[www.mass.gov/dph/publications](http://www.mass.gov/dph/publications)

### Research and Requests for Confidential Data

Selected datasets administered by the Massachusetts Department of Public Health are available for use by researchers. Certain restrictions apply which are set by state law and regulation.

[www.mass.gov/dph/research](http://www.mass.gov/dph/research)

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## Massachusetts Department of Public Health

The following data sources are held by the MDPH and are listed in alphabetical order. The word “Massachusetts” has been omitted from the beginning of the names of many of these sources.

### Asthma Call-back Survey

The Asthma Call-back Survey is a standardized questionnaire developed by the Centers for Disease Control and Prevention, administered by telephone. The survey examines the health, socioeconomic, behavioral and environmental predictors that relate to better control of asthma. It also characterizes the type of care and health care experiences of people with asthma. The data are collected every year in Massachusetts, beginning in 2006.

Respondents to the Behavioral Risk Factor Surveillance System (see also BRFSS in this section) who reported that they or the selected child in the household have ever been diagnosed with asthma were asked at the end of the BRFSS interview if they would be willing to participate in a follow-up interview on asthma. Respondents who agreed to participate were called back within 2 weeks and administered the call-back survey. Adult proxies for the selected child include parents, legal guardians, grandparents, adult siblings, other relatives or non-related adults living in the selected child’s household.

<http://www.cdc.gov/asthma/survey/brfss.html#callback>.

### Behavioral Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS) is a

continuous, random digit dial, landline-only telephone survey of adults ages 18 and older and is conducted in all states as collaboration between the federal Centers for Disease Control and Prevention (CDC) and state departments of health. The survey has been conducted in Massachusetts since 1986. The BRFSS collects data on a variety of health risk factors, preventive behaviors, chronic conditions, and emerging public health issues.

Each year the BRFSS survey includes core questions designed by the CDC and administered by all states; optional modules designed by the CDC to be added at each state's discretion; and question sets designed in collaboration with other programs of MDPH.

### **Birth Defects Monitoring Program**

Massachusetts state law requires reporting certain information related to birth defects that occur to Massachusetts residents. The file includes information on births, infant deaths, fetal deaths, and birth defects.

The primary focus of the Massachusetts surveillance system is identifying major structural birth defects. Selected genetic and chromosomal abnormalities are also included. Inborn errors of metabolism are not included but are monitored by the state newborn screening program. The surveillance reports are distributed to the public and are available online.

<http://www.mass.gov/dph/birthdefects>

### **Birth File**

See Vital Records.

### **Cancer Registry**

Massachusetts state laws require reporting to MDPH information related to newly diagnosed cases of malignant disease and benign brain-related tumors that occur to Massachusetts residents. The Massachusetts Cancer Registry currently collects data from acute care hospitals, selected physicians, and a limited number of pathology laboratories and freestanding treatment centers. Carcinoma in situ has been collected since January 1, 1992; benign brain tumors since January 1, 2004. The file includes demographic and medical

information; the variable list is included in the cancer incidence application appendix.

■ Years available: 1982-2004

### **Census of Fatal Occupational Injuries**

The Census of Fatal Occupational Injuries (CFOI), conducted by the Bureau of Labor Statistics (BLS) in the US Department of Labor, is a federal-state cooperative program that compiles an annual census of fatal occupational injuries at both the state and national levels. To be included in the fatality census, the deceased person must have been employed (working for pay, compensation, or profit) at the time of the incident, engaged in a work activity, or present at the incident site as a requirement of his or her job. Private wage and salary workers, the self-employed, and public sector workers are covered by the census. Fatalities that occur during a regular commute to or from work are excluded, as well as deaths resulting from acute or latent illnesses, which can be difficult to identify as work-related. The census includes unintentional injuries (e.g., falls, electrocutions, motor vehicle crashes) and intentional injuries (homicide and suicide). CFOI uses multiple data sources to identify and document work-related injury deaths, and CFOI counts are considered a complete or nearly complete ascertainment of work-related injury deaths. In Massachusetts, CFOI is conducted by the MDPH Occupational Health surveillance Program (OHSP) in conjunction with BLS. CFOI findings for Massachusetts can be accessed at <http://www.bls.gov/iif/oshstate.htm> and is also available on the MDPH-OHSP website: [www.mass.gov/dph/ohsp](http://www.mass.gov/dph/ohsp).

*Limitations:* CFOI reports work-related fatalities by the state in which the fatal incident occurred, which is not necessarily the state of death or state of residence. The denominator data used for calculating rates is based on state of residence. Thus, state rates may overestimate risk if deceased persons working in Massachusetts were out-of-state residents and underestimate the risk if deceased workers were Massachusetts residents but were fatally injured in other states.

### **Death File**

See Vital Records.

### **Disease Surveillance System**

See Infectious Diseases.

### **Early Intervention (EI)**

Early Intervention in Massachusetts is a statewide, integrated, developmental service available to families of children between birth and three years of age. Children may be eligible for EI if they have developmental difficulties due to identified disabilities, or if typical development is at risk due to certain birth or environmental circumstances.

EI provides family-centered services that facilitate the developmental progress of eligible children. EI helps children acquire the skills they will need to continue to grow into happy and healthy members of the community.

<http://www.mass.gov/dph/earlyintervention>

### **Food Protection Program**

The Massachusetts Food Protection Program, within Bureau of Environmental Health in the Department of Public Health, strives to ensure a safe and wholesome food supply in the Commonwealth of Massachusetts. The program accomplishes this objective by developing regulations, policies and interpretations; conducting routine inspections; conducting food borne illness complaint investigations and responding to other food emergency incidents; participating in cooperative food safety inspection programs with other state, federal and local agencies; offering educational programs; and undertaking regulatory enforcement actions such as embargoes, administrative sanctions, and civil or criminal penalties.

<http://www.mass.gov/dph/fpp>

### **Heart Disease and Stroke Prevention and Control Program**

The Massachusetts Heart Disease and Stroke Prevention and Control Program (HSPC) provides leadership across the state in the areas of Heart Disease, Stroke, Related Risk Factors.

HSPC provides education and quality improvement; creates partnerships; and promotes evidence-based changes at the policy and environmental levels to reduce disparities, disease, disability and death.

<http://www.mass.gov/dph/heartstroke>

### **HIV / AIDS Surveillance System**

See Infectious Diseases.

### **Infectious Diseases**

Approximately 80 infectious diseases and conditions are reportable in Massachusetts. Of these, 15 are reportable directly to MDPH. These include sexually transmitted diseases (STDs) and HIV/AIDS, and tuberculosis. The remaining are reportable to local public health departments and MDPH.

The Office of Integrated Surveillance and Informatics Services (ISIS) principal goal is to ensure the timely and accurate processing of critical infectious disease information. ISIS is charged with streamlining and enhancing surveillance and informatics activities and related resources in order to meet three specific surveillance and informatics goals:

- Identify commonalities and resources shared across the Bureau to achieve improved surveillance data used to make policy decisions.
- Identify and monitor disease threats and trends, including the emergence of disease in new populations and the emergence of new disease and disease variants.
- Identify and implement new technologies to support surveillance activities and emergency preparedness.

The Division of STD Prevention's primary goal is the reduction and prevention of the incidence of sexually transmitted diseases, including HIV infections. STDs are reportable directly to the Department. The clinical and epidemiologic data collected are used to track trends, identify outbreaks and provide information to prevent further transmission of disease. A variety of population- and community-based educational activities further enhance the efforts of the Division and the community to promote healthful behaviors, which reduce the burden of illness and prevent the spread of these infections.

The goal of the HIV/AIDS Surveillance Program is to provide a comprehensive picture of the HIV/AIDS epidemic in order to support prevention and health service activities delivered by the Department of Public Health and a statewide system of health care and social service organizations. The program also works collaboratively with planning and policy groups, health care providers and other Bureaus within the Department of Public

Health, providing surveillance information and assisting with assessment of resource distribution and ongoing planning to ensure that the needs of people at risk for infection or infected with HIV are met.

### **Marine Beaches in Massachusetts**

In 2000, the US Congress enacted the Beaches Environmental Assessment and Coastal Health (BEACH) Act to improve the quality of coastal recreational waters. The BEACH Act seeks to reduce the risk of disease to users of the Nation's marine recreational waters through the identification of high-risk beaches, identification and mitigation of sources of pollution, and notification/risk communication to the public. In late 2001, the Massachusetts Department of Public Health (MDPH) was awarded funding from the United States Environmental Protection Agency (USEPA) that partially support Departmental efforts to develop a bathing beaches inventory and communicate results of beach monitoring to the general public.

The Massachusetts Department of Public Health beaches website can be accessed at <http://www.mass.gov/dph/topics/beaches.htm>.

### **MassCHIP**

The Massachusetts Community Health Information Profile (MassCHIP) is a dynamic, user-friendly information service that provides free, online access to many health and social indicators. With MassCHIP, you can obtain community-level data to assess health needs, monitor health status indicators, and evaluate health programs.

Community-level data can be accessed through MassCHIP in two ways, both having a tremendous wealth of information. One way is by generating Instant Topics (formerly known as standard reports), which are predefined reports using MassCHIP's most recent data. Another way for an even more in-depth view of your data source and particular selectors, not available within Instant Topics, is by creating user-defined Custom Reports.

- **Data Sources:** Access 36 data sources with data on vital statistics, communicable diseases, sociodemographic indicators, public health program usage, and other health, education, and social service indicators.

- **Geographic Area:** Access data for particular geographic areas or levels, such as for a town, county, school district, or for the entire state.
- **Other Search Categories:** Access data by a variety of other categories, such as health topic, year, age, income level, and gender.
- **Calculated Statistics and Measurements:** Calculate various measures on selected data, such as crude rates, age-adjusted rates, or age-specific rates.
- **Types of Reports:** Create instant topics (predefined) or custom (user-defined) reports, charts, and maps.

<http://www.mass.gov/?pageID=eohhs2subtopic&L=4&LO=Home&L1=Researcher&L2=Community+Health+and+Safety&L3=MassCHIP&sid=Eeohhs2>

### **MMARS05 File – MDPH City and Town Estimates for 2005**

In the years since Census 2000, the distribution of Massachusetts residents has changed by age, race/ethnicity, and sex. In 2006, because these changes were significant, MDPH decided to produce updated population estimates by age, race/ethnicity, and sex at the city/town level.

These estimates were created using the city/town age, race/ethnicity, and sex proportions from the MDPH Census 2000 file and applying them to the MARS 2005 county estimates. The MMARS05 estimates were used to calculate population-based rates in this report, especially for EOHS regions. These estimates are available on MassCHIP.

### **Pediatric Asthma Surveillance System**

The Massachusetts Department of Public Health is one of 16 states and one metropolitan city involved in the National Environmental Public Health Tracking (EPHT) surveillance system, an ongoing data collection and analysis tool that allows public health officials to look at data about environmental hazards and health indicators to determine the need for further evaluation. Given the need for a comprehensive, systematic approach to pediatric asthma tracking in the Commonwealth, the MDPH Bureau of Environmental Health developed a proposal to CDC to track pediatric asthma through school health records as part of EPHT. In 2002, a standardized pediatric asthma surveillance

or “tracking” system that collects asthma prevalence data at the community (city/town) level was developed and implemented.

Beginning in February 2000, public school nurses and private school health contacts were mailed a one-page reporting form asking for aggregate numbers of children with asthma by grade, gender, and school building. Ideally, future efforts should attempt to obtain race/ethnicity. The list of schools was generated by the Massachusetts Department of Elementary and Secondary Education (ESE) and included any school that served grades K-8. Because several of these schools serve grades that are not included in this surveillance effort (i.e., schools serving grades 6-12), the report form and instruction sheet made it explicitly clear that only data on students in grades K-8 should be reported.

**Pregnancy to Early Life Longitudinal (PELL) Data System**, a public-private partnership between MDPH, the Boston University School of Public Health, and the Centers for Disease Control and Prevention, is an innovative, population-based data system that links vital records with a broad range of maternal and child health (MCH) datasets. Initially developed to examine the impact of prenatal and perinatal experiences on subsequent maternal, infant, and child health, PELL offers public health practitioners and researchers the ability to study risk and protective factors and health outcomes longitudinally over the life span. The core PELL data set includes birth certificates and fetal death reports linked to the infant’s birth hospital discharge (HD) record and the mother’s delivery HD record. This core linkage is longitudinally linked to hospital utilization data and statewide programmatic and surveillance datasets. PELL data have been used for the study of morbidity and mortality among children, mothers and families, tracking of hospital and program utilization and associated costs, and evaluation of state MCH programs.

**Pregnancy Risk Assessment Monitoring System (PRAMS)**, a joint surveillance project between the Centers for Disease Control and Prevention and MDPH, is a self-administered survey that collects data on maternal attitudes and experiences before, during, and shortly after pregnancy. Massachusetts PRAMS data collection began in June 2007. The PRAMS sample is randomly drawn from Massachusetts birth certificates and includes women who have had a recent live

birth in the state. Massachusetts samples approximately 2,400 women per year. Women from some groups are sampled at a higher rate to ensure adequate data are available in smaller but higher risk populations. Selected women are first contacted by mail. If there is no response to repeated mailings, women are contacted and interviewed by telephone. PRAMS data can be used to identify groups of women and infants at high risk for health problems, to monitor changes in health status, and to measure progress towards goals in improving the health of mothers and infants. PRAMS data are used by state and local governments to plan and review programs and policies aimed at reducing health problems among mothers and babies.

<http://www.mass.gov/dph/prams>

### **Occupational Health Survey of Community Health Centers**

This one time survey was carried out the MDPH Occupational Health Surveillance Program (OHSP) in collaboration with five community health centers (CHC). The purpose of the survey was to describe the occupational health experience of a sample of CHC patients, with the intent of learning more about workplace risks faced by minority and immigrant workers. During 2002-2003, a sample of 1,428 patients at the five CHCs completed the anonymous survey. Surveys were administered orally in English, Spanish, Vietnamese, Portuguese, Cape Verdean Creole and Khmer by trained interviewers. Of those approached to complete the survey, 83% were willing to participate. Participation was limited to adult patients who had worked for pay during the previous 12 months. Findings of this survey are available on the MDPH-OHSP website: <http://www.mass.gov/dph/ohsp>.

*Limitations:* Survey respondents were not necessarily representative of CHC patients throughout Massachusetts or of all patients at the five participating CHCs.

### **Sharps Injury Surveillance System**

The Massachusetts Department of Public Health requires licensed acute and non-acute care hospitals to report all sharps injuries among hospital workers to the MDPH on an annual basis, in accordance with 105 CMR 130.1007. A sharps injury is defined as a blood borne pathogen exposure incident that



is the result of events involving a contaminated sharp device that pierces the skin or mucous membranes and occurs during the performance of a worker's job duties. The Massachusetts Sharps Injury Surveillance System collects data on sharps injuries to workers in Massachusetts hospitals. Information such as the occupation of the healthcare worker, department in which the injury occurred, type of device involved in the injury, whether or not the device was a safety device, procedure for which the device was used or intended, and how the injury occurred is collected for each injury. Summary reports of surveillance findings are published annually and available on the on the MDPH-OHSP website.

*Limitations:* Underreporting of sharps injuries by employees has been documented in a number of studies, thus, the numbers reported to MDPH by hospitals are believed to be conservative estimates. Sharps injury rates presented in this report are defined as the number of reported sharps injuries per 100 licensed beds. These rates are only approximate measures of risk, as they do not take into account the number of devices used. This information is not available.

### **STD Surveillance System**

See Infectious Diseases.

### **Substance Abuse Treatment**

The Bureau of Substance Abuse Services (BSAS) manages the Substance Abuse Management Information System (SAMIS), which includes admission, discharge, and invoice information on a variety of substance abuse treatment services delivered in over 150 publicly funded treatment agencies, with over 400 separate programs.

- Years available 1992-2006; for 2007 forward, available information will vary with system changes.

### **Survey of Occupational Injuries and Illnesses (SOII)**

The Survey of Occupational Injuries and Illnesses (SOII), conducted by the Bureau of Labor Statistics (BLS) in the US Department of Labor, provides annual estimates of the numbers and incidence rates of work-related injuries and illnesses among private sector workers at the state and national levels. Information is collected from a sample of employers on all work-related injuries and illnesses that resulted in one or more of the following:

loss of consciousness, restricted work activity, job transfer, or medical treatment beyond simple first aid. In Massachusetts, the SOII is conducted by the Division of Occupational Safety within the Executive Office of Labor and Workforce Development, in conjunction with BLS. SOII findings for Massachusetts can be accessed at <http://www.bls.gov/data/home.htm#injuries> and is also available on the Division of Occupational Safety website at [www.mass.gov/dos/stats/index.htm](http://www.mass.gov/dos/stats/index.htm).

*Limitations:* Because the SOII is based on a sample—and not a census—of all employer establishments, the SOII findings are estimates subject to sampling error. The self-employed, farms with fewer than 11 employees, private households, federal agencies, the military, as well as state and municipal workers, are excluded from the SOII. These sectors collectively comprise approximately 21% of the US workforce. In addition, it is well recognized that the survey undercounts work-related illnesses, especially long-latency illnesses that may not appear until years after individuals have left their place of employment. There is also evidence that injuries are underreported.

### **Survey of Policies and Programs Related to Health for Cities and Towns in Massachusetts (2007)**

In 2002 and 2007, MDPH Bureau of Community Health Access and Promotion conducted a community-based survey. This survey was administered to the 351 cities and towns in Massachusetts and was used to inventory municipal policies and programs related to health. In 2002, various stakeholders were engaged to help in the development of the community survey; these stakeholders included DPH staff from other programs (Nutrition and Physical Activity, Diabetes Prevention and Control, and Tobacco Control), Massachusetts Municipal Association, Massachusetts Association of Health Boards, Harvard School of Public Health, Regional Planning Council representatives, and various community-based organizations. Using the CDC Community Guide as their reference, the stakeholder group identified areas of focus to be included in the survey. These areas of focus included access to physical activity facilities, access to healthy foods, and local ordinances and policies that facilitate active and healthy community environments. In 2007, the survey was updated to include two additional sections, local development and emergency preparedness and planning. For purposes of this report, only 2007 data have

been reported. In 2007, 211 cities and towns responded to the survey, with 205 identifying which region their city or town belongs to. The limitations in interpreting this data include the following: the 2007 survey results should not be generalized to the state or regionally, "do not know" and "missing" responses were dropped from the calculations for purposes of this report.

### **Teens at Work Injury Surveillance System**

The MDPH Teens at Work (TAW) Injury Surveillance System uses multiple data sources, primarily workers' compensation claims for injuries resulting in five or more lost workdays and emergency department records, to identify nonfatal work-related injuries to teens less than 18 years of age. Follow-up interviews are conducted with a sample of injured teens to learn more about factors that contributed to the injuries and to identify worksites for follow-up. TAW surveillance reports are available on the MDPH-OHSP website: <http://www.mass.gov/dph/ohsp>.

*Limitations:* The available workers' compensation data are limited to claims for injuries or illnesses resulting in five or more lost workdays. A sample of hospital emergency departments actively report injuries to working teens to MDPH on a monthly basis; however, findings based on this sample are not representative of all occupational injuries to teens treated in hospital emergency departments. The statewide dataset of all emergency department visits is also used to characterize work-related injuries to teens on an annual basis. Designation of workers' compensation as payer is used to identify work-related cases in this dataset. As noted in description of workers' compensation data, not all injured workers' eligible for workers' compensation are reported to the workers' compensation system. Thus, findings of work-related injuries to teens based on workers' compensation information are believed to be conservative estimates. The sample of teens with work-related injuries that complete interviews is not necessarily representative of all teens with work-related injuries in the state.

### **Violent Death Reporting System (MAVDRS)**

The Massachusetts Violent Death Reporting System (MAVDRS) collects and links data on all violent deaths within the Commonwealth. It includes detailed information on all

homicides, suicides, unintentional firearm deaths, and deaths of undetermined intent.

The system combines information from death certificates, medical examiner records, toxicology reports, police reports and crime laboratory reports. Individually, these sources explain violence only in a narrow context; together, they provide comprehensive answers to the questions that surround violent death: who, what, when, where, and, in many cases, why. No other system offers this benefit.

This standardized database is part of the National Violent Death Reporting System (NVDRS) developed and funded by the Centers for Disease Control and Prevention (CDC). There are currently 18 states funded to participate in NVDRS. Massachusetts was one of the first six states funded. Data collection began with deaths occurring on or after January 1, 2003.

The ultimate goal of NVDRS is to provide communities with a clearer understanding of violent deaths so these deaths can be prevented. Understanding the complex circumstances surrounding these deaths will provide important and useful information in the development of prevention initiatives. NVDRS provides insight into the potential points for intervention and ways to evaluate and improve violence prevention efforts.

### **Women, Infants and Children (WIC) Nutrition Program**

The Massachusetts Women, Infants and Children Nutrition (WIC) Program provides nutrition and health education, healthy food and other services free of charge to Massachusetts families who qualify. Participants receive checks to buy free healthy food such as milk, cheese, 100% fruit juices, cereals, infant formula, peanut butter, carrots, tuna, dried beans, and eggs. The WIC Program collaborates with the US Department of Food and Agriculture to provide WIC participants with coupons, redeemable at Farmers' Markets for fresh fruits and vegetables during the summer months.

WIC's goal is to help keep pregnant and breastfeeding women and children under age five healthy. WIC provides personalized nutrition consultations, checks to buy free, healthy food, referrals for medical and dental care, health insurance, childcare, housing and fuel assistance, and other services that can benefit the whole family.

WIC also offers immunizations screening and referrals, breast-feeding support, and nutrition and health workshops on a variety of topics including meal planning, maintaining a healthy weight, picky eaters, caring for a new baby, and shopping on a budget.

[http://www.mass.gov/?pageID=eohhs2subtopic&L=5&LO=Home&L1=Consumer&L2=Basic+Needs&L3=Food+%26+Nutrition&L4=Women%2C+Infants+and+Children+\(WIC\)+Nutrition+Program&sid=Eeohhs2](http://www.mass.gov/?pageID=eohhs2subtopic&L=5&LO=Home&L1=Consumer&L2=Basic+Needs&L3=Food+%26+Nutrition&L4=Women%2C+Infants+and+Children+(WIC)+Nutrition+Program&sid=Eeohhs2)

### **Workers' Compensation Data**

Workers' compensation is a no-fault insurance system designed to provide medical benefits and lost wage replacement to workers who sustain work-related injuries or illnesses. Massachusetts law requires both private and public sector employers, with rare exceptions, to maintain workers' compensation insurance coverage. All injuries or illnesses arising out of the course of employment that result in five or more lost work days must be reported to the Massachusetts Department of Industrial Accidents (DIA), where the records are entered into the electronic case management system. These MDIA data are made available to the MDPH Occupational Health surveillance Program for purposes of conducting surveillance of work-related injuries and illnesses. OHSP reports based on MDIA data can be found on the MDPH-OHSP website.

*Limitations:* In Massachusetts, the workers' compensation system excludes railroad workers, seafarers, police officers, firefighters, shipyard and harbor workers, and federal employees who are covered by other insurance systems. The self-employed are also excluded. (In 2004, the Massachusetts workers' compensation law was changed to allow self-employed workers to carry workers' compensation coverage voluntarily). A number of studies conducted in various states have demonstrated that not all work-related injuries and illnesses among workers eligible for workers' compensation are reported to state workers' compensation systems. There are substantial differences among the workers' compensation systems across states that preclude inter-state comparisons, and national workers' compensation data are not available.

### **Worksite Health Improvement Survey (2008)**

In April 2008, MDPH surveyed a random sample of 3,000 Massachusetts worksites with 11 or more employees to assess

their practices with regard to promoting and protecting employee health and well-being within their organizations. Just fewer than 30% of the businesses (890) responded, providing a comprehensive picture of how well the Commonwealth's businesses support health-promoting behaviors. The sampling frame for the survey consisted of a list of 30,584 worksites with 11 or more employees in the Commonwealth of Massachusetts. Potential respondents were selected at random, providing a stratified sample of 3,000 worksites. Since over half of the worksites had no more than 24 employees, the sampling plan was designed to provide sufficient numbers of responses among organizations with more than 24 employees. The range of error on a simple random sample of 890 worksites out of a population of 30,584 is plus or minus 3.3% at the 95% level of confidence. The range of error adjusted for the stratified sampling plan is plus or minus 0.66% at the 95% level of confidence. However, sampling error is but one of several possible sources of error in the data. The respondent's interpretation of the questions and the accuracy of their knowledge about their worksite could be sources of error in the survey findings. The survey results have been statistically weighted to represent the organizations by number of employees and MDPH region in the same proportions in which they appeared in the sampling frame of 30,584 worksites.

### **Vital Records**

MDPH holds data relating to nearly 250,000 annual vital events (e.g., births, marriages, deaths) that occur in Massachusetts in accordance with Massachusetts General Laws and regulations.

### **Mortality**

Data on mortality are based on information on death certificates filed with the Massachusetts Registry of Vital Records and Statistics. Physicians and medical examiners assign the cause of death through a system that acknowledges the possibility of multiple causes. Demographic information on the certificates, such as age, race, Hispanic ethnicity, gender, educational attainment, marital status, and occupation, is recorded by the funeral director based on information provided by an informant, usually a family member, or, in the absence of an informant, based on observation or omitted. Resident data include all deaths that occur to residents of the Commonwealth, regardless of where they happen. In Massachusetts, a resident is a

person with a permanent address in one of the 351 cities or towns. Occurrence data include all events that occur within the state, whether to residents or nonresidents. All data in this chapter are for Massachusetts residents unless otherwise stated. There is an exchange agreement among the 50 states, District of Columbia, Puerto Rico, US Virgin Islands, Guam, and Canadian provinces that provides for the exchange of copies of death records for persons dying in a state other than their state of residence. These records are used for statistical purposes only, and allow each state or province to track the deaths of its residents.

The underlying cause of death is generated by the Super Mortality Medical Indexing, Classification, and Retrieval system (Super MICAR). This is a computer software algorithm developed by the National Center for Health Statistics and used by all US jurisdictions so that assignment of cause of death codes is consistent throughout the US

### **Births**

The current file format was implemented in 1996 and includes demographic information about the parents, infant characteristics, pregnancy and prenatal care information, and medical information about the mother and infant.

- Years available: 1969-2006

### **Linked birth/infant deaths**

The linked birth/infant death file is a data set composed of linked birth and death certificates for infants born in Massachusetts who died before reaching one year of age. This is a birth file cohort, with a given year's birth records linked with deaths for that year and the following year. The format includes data elements from birth and death certificates.

- Years available: 1987-2005

### **Fetal deaths**

The fetal death file includes information on reported fetal deaths of 20 or more weeks gestation or those where the fetus weighed at least 350 grams. The current file format was implemented in 1998 and includes demographic information about the parents and medical information about the mother and fetus.

- Years available: 1970 – 2006

### **Youth Health Survey (YHS)**

The Youth Health Survey is the Massachusetts Department of Public Health's (MDPH) surveillance project to assess the health of public school students in grades 6 through 12 (Massachusetts Department of Public Health, 2008). It is conducted every other year by the MDPH in collaboration with the Massachusetts Department of Elementary and Secondary Education (ESE). The survey was administered to approximately three randomly selected high school classrooms and two randomly selected middle school classrooms in each participating school. In 2007, data were collected from over 3,000 high school students within 58 schools and from over 2,700 middle school students from grades 6 through 8 within 67 schools. The overall response rate (student response rate x school response rate) was 74% for the high school survey and 49% for the middle school survey. The survey contains questions regarding health status, risk behaviors, and protective factors. The MA YHS survey instrument and methodology are available from the Massachusetts Department of Public Health, Office of Statistics and Evaluation.

As a result of close adherence to the scientific sampling process and the creation of weights to account for non-response, the MA YHS statistics presented in this report are representative of students attending public middle and high schools in Massachusetts. Since students from the same school are more likely to be similar to one another than to students from different schools, all analyses account for the effect of clustering at the school level (Massachusetts Department of Public Health, 2008).

<http://www.doe.mass.edu/cnp/hprogrms/yrbs/2007YRBS.pdf>

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## **Federal Governmental Agencies**

### **American Community Survey (ACS), US Census Bureau**

The American Community Survey (ACS) is a new approach for collecting accurate, timely information needed for critical government functions. The American Community Survey provides annual estimates of demographic, housing, social, and economic characteristics for numerous geographies every year. The American Community Survey provides one-year estimates for all states as well as for cities, counties, and metropolitan areas with a total population of 65,000 or more. Beginning in

December 2008, the American Community Survey began to provide three-year estimates for geographies with a total population of 20,000 or more. By the end of 2010, the American Community Survey plans to provide 5-year estimates for all geographies, even those with very small populations.

The American Community Survey data sets are available from the US Census Bureau, American Factfinder.

[http://factfinder.census.gov/home/saff/main.html?\\_lang=en](http://factfinder.census.gov/home/saff/main.html?_lang=en)

### **Current Population Survey (CPS), Bureau of Labor Statistics**

The Current Population Survey (CPS) is a monthly survey of about 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The survey has been conducted for more than 50 years.

The CPS is the primary source of information on the labor force characteristics of the US population. The sample is scientifically selected to represent the civilian non-institutional population. Respondents are interviewed to obtain information about the employment status of each member of the household 15 years of age and older. However, published data focus on those ages 16 and over. The sample provides estimates for the nation as a whole and serves as part of model-based estimates for individual states and other geographic areas.

CPS data are used by government policymakers and legislators as important indicators of our nations' economic situation and for planning and evaluating many government programs. They are also used by the press, students, academics, and the general public.

<http://www.census.gov/cps/>

### **Healthy People 2010**

Healthy People 2010 is a set of health objectives for the Nation to achieve over the first decade of the new century. It can be used by many different people, States, communities, professional organizations, and others to help them develop programs to improve health.

Healthy People 2010 builds on initiatives pursued over the past two decades. The 1979 Surgeon General's Report, *Healthy*

*People*, and *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* both established national health objectives and served as the basis for the development of State and community plans. Like its predecessors, Healthy People 2010 was developed through a broad consultation process, built on the best scientific knowledge and designed to measure programs over time.

<http://www.healthypeople.gov/default.htm>

### **Local Area Unemployment Statistics (LAUS), Bureau of Labor Statistics**

The Local Area Unemployment Statistics (LAUS) program is a Federal-State cooperative effort in which monthly estimates of total employment and unemployment are prepared for approximately 7,300 areas including states, counties and county equivalents, cities of 25,000 population or more, and cities and towns in New England regardless of population.

These estimates are key indicators of local economic conditions. The Bureau of Labor Statistics (BLS) of the US Department of Labor is responsible for the concepts, definitions, technical procedures, validation, and publication of the estimates that State employment security agencies prepare under agreement with BLS.

A wide variety of customers use these estimates, including Federal programs, state and local governments, and private industry, researchers, the media, and other individuals.

<http://www.bls.gov/lau/lauov.htm>

### **Modified Age, Race, Sex (MARS) Estimates, National Center for Health Statistics (NCHS)**

The National Center for Health Statistics (NCHS) releases bridged-race population estimates of the resident population of the United States, based on Census 2000 counts, for use in calculating vital rates. These estimates result from bridging the 31 race categories used in Census 2000, as specified in the 1997 Office of Management and Budget (OMB) standards for the collection of data on race and ethnicity, to the four race categories specified under the 1977 standards. Many data systems, such as vital statistics, are continuing to use the 1977 OMB standards



during the transition to full implementation of the 1997 OMB standards. The bridged-race population estimates are produced under a collaborative arrangement with the US Census Bureau.

Each year, the Massachusetts Department of Public Health (MDPH) downloads the MARS file from NCHS and customizes it for the needs of the Department. For example, single year of age data are combined into five-year age groups, Hispanic ethnicity information is combined with race to form special race and Hispanic ethnicity groups, such as, White non-Hispanic. The standard population files for the Department are created and used as the denominators of rates, such as death rates and teen birth rates.

MARS files are available from [http://www.cdc.gov/nchs/nvss/bridged\\_race.htm](http://www.cdc.gov/nchs/nvss/bridged_race.htm).

### **National Survey on Drug Use and Health (NSDUH), Substance Abuse and Mental Health Services Administration (SAMHSA)**

The National Survey on Drug Use and Health (NSDUH) is an annual nationwide survey involving interviews with approximately 70,000 randomly selected individuals aged 12 and older. Data from the NSDUH provide national and state-level estimates on the use of tobacco products, alcohol, illicit drugs (including non-medical use of prescription drugs) and mental health in the United States. In keeping with past studies, these data continue to provide the drug prevention, treatment, and research communities with current, relevant information on the status of the nation's drug usage. To assess and monitor the nature of drug and alcohol use and the consequences of abuse, NSDUH strives to: provide accurate data on the level and patterns of alcohol, tobacco, and illicit substance use; track trends in the use of alcohol and various types of drugs; assess the consequences of substance use and abuse; and identify those groups at high risk for substance use and abuse.

<https://nsduhweb.rti.org/>

### **National Vital Statistics System (NVSS), CDC/NCHS**

NVSS collects and publishes official national statistics on births, deaths, fetal deaths, and, prior to 1996, marriages and divorces occurring in the United States, based on US Standard

Certificates. Fetal deaths are classified and tabulated separately from other deaths. The are five vital statistics files — Birth, Mortality, Multiple Cause-of-Death, Linked Birth/Infant Death, and Compressed Mortality.

### **National Vital Statistics System (NVSS), Compressed Mortality File (CMF)**

The CMF is a county-level national mortality and population database. The CMF contains mortality data derived from the detailed Mortality files of the National Vital Statistics System and estimates of US national, state, and county resident populations from the US Census Bureau. For 1968–1998, number of deaths, crude death rates, and age-adjusted death rates can be obtained by place of residence (total US, state, and county), age group, race (white, black, and other), sex, year of death, and underlying cause of death. For 1999–2006, mortality statistics can be obtained by place of residence, by age group and expanded race groups (white, black, American Indian or Alaska Native, Asian or Pacific Islander), and by Hispanic origin.

[http://www.cdc.gov/nchs/products/elec\\_prods/subject/mcompres.htm](http://www.cdc.gov/nchs/products/elec_prods/subject/mcompres.htm)

### **Population Estimates Program, US Census Bureau**

The Census Bureau's Population Estimates Program publishes population numbers between censuses. The Census Bureau publishes July 1 estimates for years after the last decennial census (2000), as well as for past decades. Data series for births, deaths, and domestic and international migration are used to update the decennial census base counts.

The Population Estimates Program develops and prepares the official estimates of the population by age, sex, race, and Hispanic origin for the nation, states and counties. The Program provides estimates of the total populations of towns and cities. These estimates are used in federal funding allocations as denominators for vital rates and per capita time series, as survey controls, and in monitoring recent demographic changes. With each new issue of July 1 estimates, the Census Bureau revises estimates for years back to the last census. Previously published estimates are superseded and archived.

[http://factfinder.census.gov/home/saff/main.html?\\_lang=en](http://factfinder.census.gov/home/saff/main.html?_lang=en)



### **Regional Economic Information System (REIS), Bureau of Economic Analysis (BEA)**

This system contains information for all counties, States, metropolitan statistical areas, and BEA Economic Areas, 1969-99, for personal income by major source, per capita personal income, population, earnings by 2-digit Standard Industrial Classification (SIC) industry, full-time and part-time employment by 1-digit SIC industry, regional economic profiles, transfer payments by major program, farm income and expenses, and the BEA Regional Fact Sheet (BEARFACTS). It also includes State quarterly personal income estimates; county-level gross commuting flows for 1981-99; Census Bureau estimates on intercounty commuting flows for 1960, 1970, 1980, and 1990; and Census Bureau county-level commuting flows and average wage estimates at the 1-digit SIC level for 1980 and 1990.

<http://www.bea.gov/bea/regional/reis/>

### **Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC), Centers for Disease Control and Prevention (CDC)**

The Adult and Maternal and Child Health Smoking-Attributable Mortality, Morbidity and Economic Cost (SAMMEC) software was developed by the CDC to estimate the disease impact of smoking among adults and pregnant women in the United States, individual states, and other large populations. The disease impact of smoking refers to the health and health-related economic consequences of smoking, including smoking-attributable deaths, years of potential life lost, excess health care expenditures, and productivity losses. These measures help public health researchers and policymakers quantify the adverse effects of cigarette smoking.

The SAMMEC application contains two distinct Internet-based computational programs that can be used to estimate the disease impact of smoking on adults and infants. The Adult SAMMEC application provides users the ability to estimate Smoking-Attributable Mortality (SAM), Years of Potential Life Lost (YPLL), medical expenditures, productivity losses, SAM rate and YPLL rate. The Maternal and Child Health (MCH) SAMMEC application provides users the ability to estimate smoking-attributable infant deaths, YPLL and excess neonatal health care costs.

<http://apps.nccd.cdc.gov/sammec/index.asp>

### **WONDER, Centers for Disease Control and Prevention (CDC)**

The Wide-ranging Online Data for Epidemiologic Research (WONDER) is an easy-to-use, menu-driven system that makes the information resources of the Centers for Disease Control and Prevention (CDC) available to public health professionals and the public at large. It provides access to a wide array of public health information.

<http://wonder.cdc.gov>

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### **Massachusetts State Agencies**

#### **Air & Climate Data, Massachusetts Department of Environmental Protection (MassDEP)**

The MassDEP maintains a website through which residents can download ambient air quality data. MassDEP air monitoring data from 2007 through yesterday is available for download by month and year. Files are created each night, meaning today's data will not be available until tomorrow. If you require data for today, click on one or both of these tabs: Trends by Pollutant or Trends by Site.

<http://public.dep.state.ma.us/MassAir/Pages/GetData.aspx?&ht=2&hi=203>

#### **Board of Registration in Medicine – Physicians Registered in Massachusetts**

Massachusetts was the first state to offer a comprehensive program to give patients access to information about the education, training, and experience of all licensed physicians. The "Physician Profiles" program is one tool patients can use to make the right health care decisions. Patients are encouraged to use the physician profile information to foster better communication with a physician. Consumers use Physician Profiles when trying to choose a physician from a list supplied by their health insurer. Others have found the information useful when they have been referred to a specialist. Expectant mothers use Physician Profiles as one step in choosing an obstetrician. Many physicians use the system to help patients when making a referral to a specialist.

The following information is available: Education, Training, Medical Specialties, Professional demographics, including

business address, insurance plan and hospital affiliations, and available translation services, professional or community awards received, research or publications by the physician, malpractice claims paid in the past ten years, hospital discipline in the past ten years, criminal convictions in the past ten years, disciplinary actions of the Massachusetts Board of Registration in Medicine in the past ten years.

Physician Profiles can be found on the Board's Web site: [www.massmedboard.org](http://www.massmedboard.org)

## **Division of Health Care Finance and Policy Datasets**

### **Acute Hospital Case Mix Databases**

The Division of Health Care Finance and Policy (Division) collects patient-level data for Massachusetts acute care hospital inpatients, observation patients, and emergency room patients to support the Division's analyses of such issues as preventable hospitalizations, hospital market analysis, alternative care settings, the patient care continuum, and comparative costs and outcomes in acute care hospitals.

Hospitals report their data to the Division on a quarterly basis for the fiscal year beginning on October 1. The Division prepares the annual database for each of the three data types available to the public. Data submissions are edited, summarized, and returned to the submitting hospital to verify the accuracy of the records.

### **Emergency Department Database**

The Outpatient Emergency Department Database (ED) contains data elements that are similar to those contained in the inpatient and observation stay databases, with some additions relevant to the ED setting. Data elements include patient demographics, clinical characteristics, services provided, charges, and hospitals and practitioner information, as well as mode of transport.

### **Inpatient Discharge Database**

The Division collects case mix and charge data for all inpatients discharged from Massachusetts acute care hospitals. The Hospital Inpatient Discharge Database (HIDD) contains

comprehensive patient-level information including socio-demographics, clinic data, and charge data. It is used to establish reasonable and adequate rates, to enable hospitals to be grouped for comparing costs, to assist in the formulation of health care delivery and financing policy, and to assist in the provision and purchase of health care services.

### **Outpatient Observation Database**

The Division also collects case mix and charge data for all outpatient observation visits to Massachusetts acute care hospitals. The Outpatient Hospital Observation Discharge Database (OOA) contains comprehensive patient-level information, including socio-demographics, clinic data, and charge data. Data users include hospitals, strategic planners, policy makers, researchers, and program evaluators.

## **Drinking Water Program, Bureau of Resource Protection, Massachusetts Department of Environmental Protection**

The Bureau of Resource Protection is responsible for protecting critical inland and coastal water resources, controlling point and nonpoint sources of pollution, safeguarding public drinking water supplies, ensuring public access to the waterfront, and administering revolving loan programs that help the state's towns and cities improve their environmental infrastructure.

The Drinking Water Program ensures that the drinking water delivered by public water systems in Massachusetts is fit and pure according to national and state standards. As US EPA'S Primacy Agent for the federal Safe Drinking Water Act in Massachusetts, the Program regulates water quality monitoring, new source approvals, water supply treatment, distribution protection, and reporting of water quality data. It also coordinates with MassDEP's Office of Watershed Management, the Water Resources Commission, and DEM's Division of Water Resources in regulating quantity of water used for drinking water supplies and in promoting water conservation. The Program maintains an active community technical assistance program to assist public water suppliers, Boards of Health, and other local groups to develop drinking water source protection plans, write local water supply bylaws, and comply with state and federal water supply regulations. Other Program activities include approval of new water supply technologies, regulation of water vendors, source approval for bottled water (bottling regulated

by MA Department of Public Health), and public education on drinking water issues.

<http://www.mass.gov/dep/about/organization/aboutbrp.htm#top>

### **Labor Force and Unemployment Data, Division of Unemployment Assistance, Executive Office of Labor and Workforce Development (EOLWD)**

Labor force and unemployment data are estimated each month. Information is produced on labor force, employment, unemployment, and unemployment rates for the United States, the Commonwealth and for each Labor Market Area (LMA), Workforce Investment Area (WIA), City and Town, and County in Massachusetts. Use the query tool below to obtain Labor Force and Unemployment data by area and time period.

<http://lmi2.detma.org/Lmi/Unemployment.asp>

### **New England Newborn Screening Program (NENSP), University of Massachusetts Medical School**

The New England Newborn Screening Program is a comprehensive public health screening program for newborns, providing service for five New England states. The program provides high quality, timely, low-cost laboratory screening, clinical follow-up and research to prevent or minimize the effects of disorders that can lead to death, mental retardation and life-compromising conditions in newborns.

Serving Massachusetts since 1962, the population served by the Program was expanded in 1978 when state public health departments in New England joined together to have all newborns tested. The Program provides screening for newborns in the states of Massachusetts, Maine, New Hampshire, Rhode Island and Vermont — about 500 babies every day.

The New England Newborn Screening Program employs over a dozen laboratory technicians and five technical supervisors, all highly trained, all of whom meet federal Clinical Laboratory Improvement Amendments (CLIA) regulations for high complexity testing. Clinical follow-up, data management and office staff assure continuity of flow for quality-controlled data from the hospitals through to results reporting. In addition, three Ph.D.s and

three M.D.s assure quality analysis of the laboratory technology, testing algorithms, and treatment protocols and provide support to the medical community, who welcome accurate information about the rare disorders included in newborn screening.

<http://www.umassmed.edu/nbs/index.aspx?linkidentifier=id&itemid=1606>

### **Workers' Compensation Database**

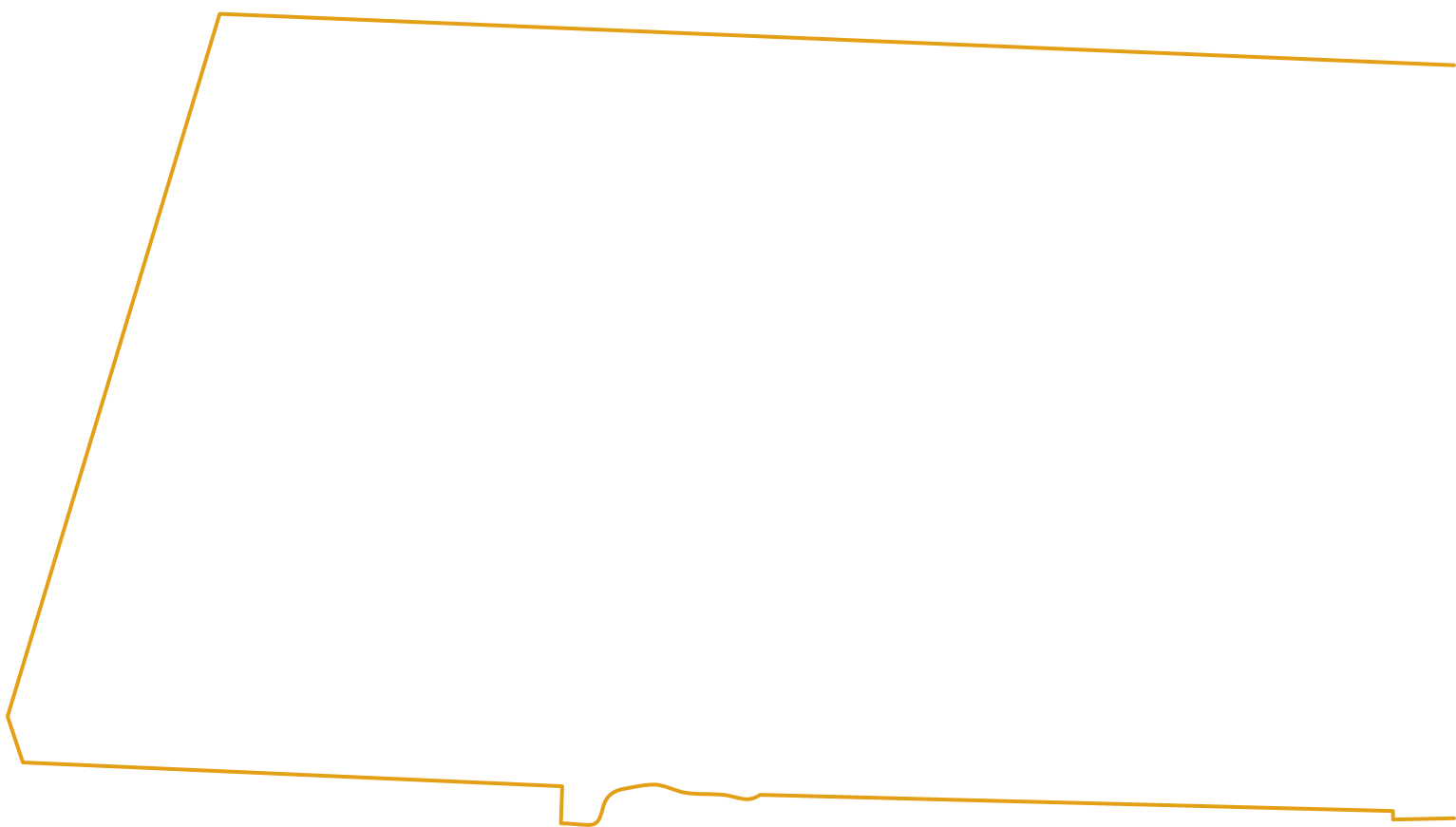
This database is maintained by the Department of Industrial Accidents (DIA), Claims Processing Operations Unit. The Claims Processing Operations Unit has two functions. The first being receipt of lost time reports reflecting five days of lost time, insurance forms, claims and liens.

The second function is entering information (including online filings) into their case management database. This Unit established the workers' compensation case at the initial level and may result in the scheduling of a conciliation.

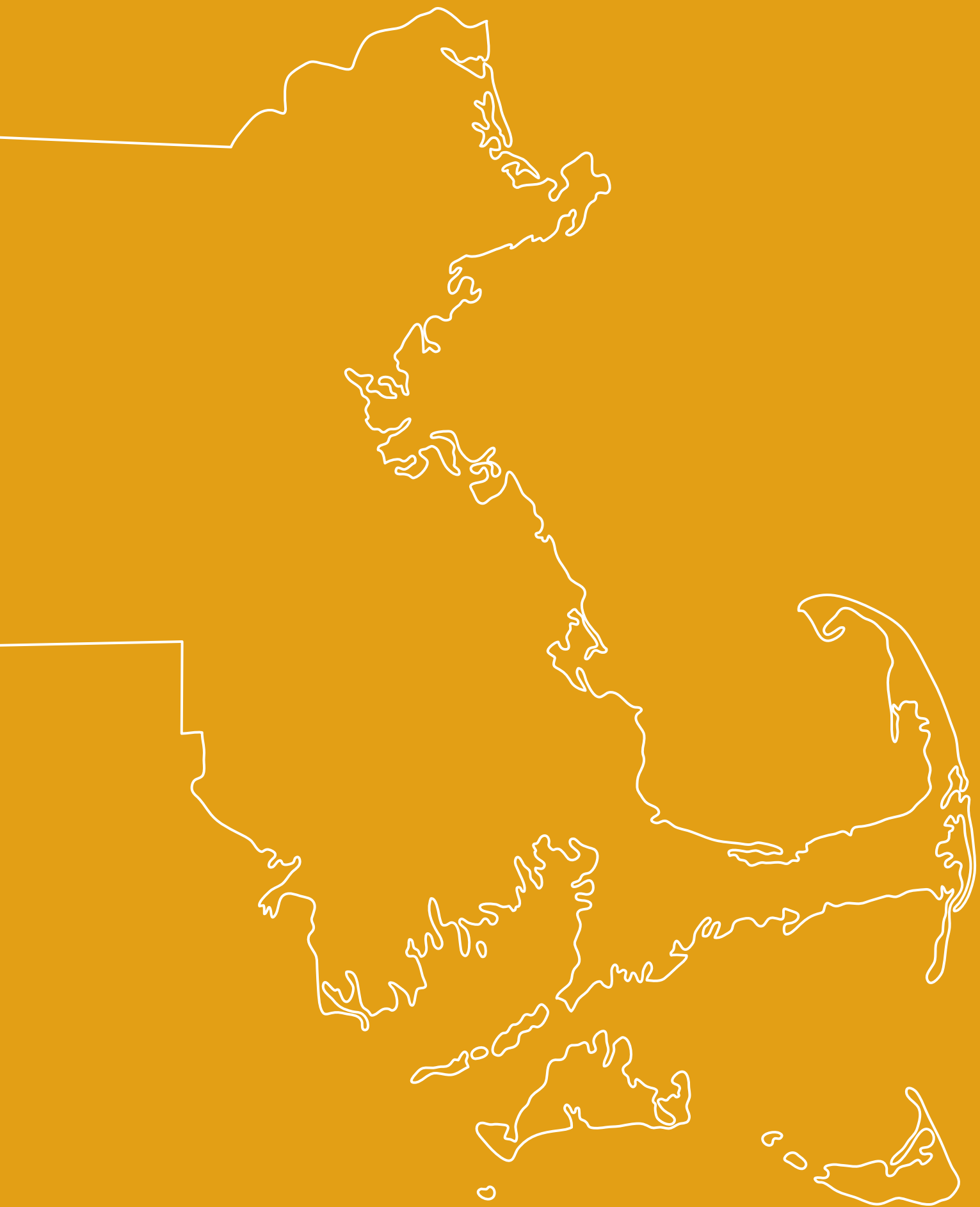
# Contact Information

Massachusetts Department of Public Health	
Main Number	(617) 624-6000 · TDD/TTY (617) 624-6001
Adolescent Health	(617) 624-6060
Asthma Prevention and Control	(617) 624-5070
Birth Defects Center	(617) 624-5507
Birth, Death, Marriage Records	(617) 740-2606
Budget Office	(617) 624-5260
Cancer Prevention and Control	(617) 624-5070
Cancer Registry	(617) 624-5642
Childhood Lead Poisoning Prevention	(800) 532-9571
Commissioner's Office	(617) 624-6000
Community Health Access and Promotion	(617) 624-5070
Community Sanitation	(617) 624-5757
Determination of Need	(617) 753-7342
Diabetes Prevention and Control Program	(617) 624-5070
Early Intervention	(617) 624-6060
Emergency Medical Services	(617) 753-7300
Emergency Preparedness	(617) 624-5712
Environmental Health	(617) 624-5757 · TDD/TTY (617) 624-5286
Family Health and Nutrition	(617) 624-6060
Family Planning	(617) 624-6060
Food Protection Program	(617) 983-6700
General Counsel	(617) 624-5220
Health Care Safety and Quality	(617) 753-8000
Health Information, Statistics, Research and Evaluation	(617) 624-5600
Health Professions Licensure and Boards of Registration	(617) 973-0800 · TDD/TTY (617) 973-0895
Health Survey Program (BRFSS)	(617) 624-5623
Healthy Aging and Disability	(617) 624-5070
Heart and Stroke Program	(617) 624-5070
HIV / AIDS	(617) 624-5300 · TDD/TTY (617) 624-5387
Hospital Interpreter Services	(617) 624-6011
Human Resources	(800) 850-6968
Immunization Program	(617) 983-6800
Infectious Disease	(617) 983-6550
Injury Prevention and Control	(617) 624-5070
Injury Surveillance Program	(617) 624-5648

<b>Institutional Review Board (IRB) and data for research</b>	(617) 624-5229
<b>Lemuel Shattuck Hospital</b>	(617) 522-8110
<b>Massachusetts Hospital School</b>	(781) 828-2440
<b>Media Relations</b>	(617) 624-5006
<b>Men's Health Partnership</b>	(617) 624-5070
<b>Nutrition and Physical Activity Unit</b>	(617) 624-5070
<b>Occupational Health Surveillance</b>	(617) 624-5632
<b>Oral Health</b>	(617) 624-6060
<b>Perinatal, Early Childhood, and Special Health Needs</b>	(617) 624-6060 · TDD/TTY 624-5992
<b>Primary Care Programs</b>	(617) 624-6060
<b>Privacy and Data Access Office</b>	(617) 624-5194
<b>Public Health Council Secretary</b>	(617) 753-8206
<b>Radiation Control</b>	(617) 242-3035
<b>Refugee and Immigrant Health Program</b>	(617) 983-6590
<b>Regional Health Offices</b>	
<b>Central Regional Health Office</b>	(508) 792-7880 · TDD/TTY (508) 835-9796
<b>Metro Boston Regional Health Office</b>	(781) 828-7700 · TDD/TTY (781) 774-6619
<b>Northeast Regional Health Office</b>	(978) 851-7261 · TDD/TTY (978) 851-0829
<b>Southeast Regional Health Office</b>	(508) 984-0600 · TDD/TTY 508-984-0636
<b>Western Regional Health Office</b>	(413) 586-7525 · TDD/TTY (800) 769-9991
<b>Registry of Vital Records and Statistics</b>	(617) 740-2600
<b>Research and Epidemiology</b>	(617) 624-5600
<b>Rural Health</b>	(508) 792-7880 Ext. 2172
<b>School Health</b>	(617) 624-6060
<b>School-Based Health Centers</b>	(617) 624-6015
<b>State Office of Pharmacy Services</b>	(978) 858-2100
<b>Substance Abuse Services</b>	(617) 624-5111 · TDD/TTY (617) 624-5186
<b>Suicide Prevention</b>	(617) 624-5070
<b>Tewksbury Hospital</b>	(978) 851-7321
<b>Tobacco Control</b>	(617) 624-5900
<b>Violence Prevention</b>	(617) 624-5070
<b>Western Massachusetts Hospital</b>	(413) 562-4131
<b>William Hinton State Laboratory Institute</b>	(617) 983-6200
<b>Women Infants &amp; Children (WIC)</b>	(617) 624-6100
<b>Women's Health Network</b>	(617) 624-5070









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[www.mass.gov/dph](http://www.mass.gov/dph)