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Prevalence of Asthma Among Adults and Children in Massachusetts

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Massachusetts Department of Public Health

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1. Introduction

Asthma is a chronic inflammation of the airways. Airways become constricted with swelling and excessive mucous production, making it difficult to breathe. Symptoms of asthma are wheezing, coughing, and chest tightness. Sometimes the symptoms become so severe they result in an asthma attack that requires immediate medical treatment. Asthma affects individuals differently, resulting in differing severity, presentation of symptoms, and responsiveness to treatment. When not treated, asthma can cause disability and even death.

This brief presents data on the prevalence of asthma among adults and children in Massachusetts. Asthma prevalence is the proportion of individuals in a population who have asthma at a point in time or during a given time period. In this report, prevalence is reported as a percentage of the population. The statewide asthma prevalence estimates for adults and children are based on self-reported data collected through the Massachusetts Behavioral Risk Factor Surveillance System.

2. Data Source

Adults: Massachusetts Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based system of health surveys established by the Centers for Disease Control and Prevention (CDC) in 1984. As in other states, the Massachusetts BRFSS surveys a representative sample of adults in Massachusetts whose phone numbers are obtained through random-digit dialing to obtain information on health outcomes, health behaviors, preventive health practices, and healthcare access primarily related to chronic disease and injury. Two questions in the BRFSS are used to generate prevalence estimates for “lifetime” and “current” asthma. A person who responds “yes” to the question — “Have you ever been told by a doctor, nurse or health professional that you had asthma?” — is considered to have lifetime asthma and is then asked, “Do you still have asthma?”. People who answered “yes” to this second question are considered to have current asthma.

Data from 2000-2015 are included in this report. Through 2010, CDC used a statistical method called post-stratification so BRFSS survey data was weighted to simultaneously adjust survey respondent data to known proportions of age, race and ethnicity, gender, geographic region, or other known characteristics of a population. This type of weighting is important because it makes the sample more representative of the population, and adjusts for nonresponse bias. In 2011, however, two changes were made to BRFSS in

order to ensure its data remains valid and accurately represents its target population of adults ≥18 years of age who do not live in institutional settings. These changes:

- Increased the number of interview calls made to cellular telephone numbers.
- Replaced the "post-stratification" weighting method with a more advanced method called "iterative proportional fitting," also called "raking."

A detailed, technical description of the "raking" weight is below.

Raking (Iterative) Weighting
This technique of weighting applied to BRFSS data started in 2011. Raking the data allows more demographic variables into the statistical weighting process. These variables include, but are not limited to: level of educational attainment; marital status; and homeownership. Including more variables reduces the potential for selection-bias due to non-response, and increases how well the data represents the population surveyed. Furthermore, raking the survey sample allows the telephone source by which respondents were reached (landline vs. cellular telephone), to be taken into consideration in weighting.

Note: In tables and figures below, pre-raking and post-raking weight estimates are separated by a dashed line. Due to the use of the new weighting technique, data from 2011 on cannot be aggregated with years prior to 2011 for analysis. Findings are compared to national estimates where possible.

Where applicable, trend analyses were completed to look at significant changes over time using all years of data available. Otherwise, cross-sectional analyses are presented using the most recent years of data available.

Children: Massachusetts Behavioral Risk Factor Surveillance System

The ranking weight technique is also applied on the BRFSS Children Survey. For children under 18 years of age, the information is collected from an adult family member, usually a parent, who is knowledgeable about the child's health. The adults report on one randomly selected child under the age of 18 living in their household. The questions for adults and children are identical. Data from these questions provide statewide estimates of prevalence and incidence of pediatric asthma. Due to the limited sample size available, in most instances, three years (2013-2015) of data are aggregated to derive more stable estimates.

Definitions

Adults: Individuals 18 years of age and older.

Children: Individuals under 18 years of age.

Prevalence: The proportion of individuals in a population who have asthma at a point in time or during a given time period.

Lifetime Asthma: Ever having asthma; classification for those answering “yes” to the question, “Have you ever been told by a doctor, nurse or health professional that you had asthma?”

Current Asthma: Having asthma at the time of data collection; classification for those answering “yes” to both, “Have you ever been told by a doctor, nurse or health professional that you had asthma?”, and, “Do you still have asthma?”

Current Smoker: Respondents who reported smoking at least 100 cigarettes in their lifetime and who, at the time of survey, smoked either every day or some days.

Former Smoker: Respondents who reported smoking at least 100 cigarettes in their lifetime and who, at the time of the survey, did not smoke at all.

Never Smoker: Respondents who reported never having smoked 100 cigarettes.

Disabled: Respondents who answered “yes” to one or more of the following conditions: for at least one year, 1) They had an impairment that limited activities or caused cognitive difficulties, 2) They used special equipment or required help from others to get around, or 3) Reported a disability of any kind.

Non-Disabled: Respondents who answered “no” to all of the following conditions for at least one year: 1) They did not have an impairment that limited activities or caused cognitive difficulties, 2) They did not use special equipment or require help from others to get around, or 3) Did not reported a disability of any kind.

Overweight: For adults, overweight ranges are determined by using weight and height to calculate a number called the "body mass index" (BMI). BMI is used because, for most people, it correlates with the amount of body fat. An adult who has a BMI between 25 and 29.9 is considered overweight.

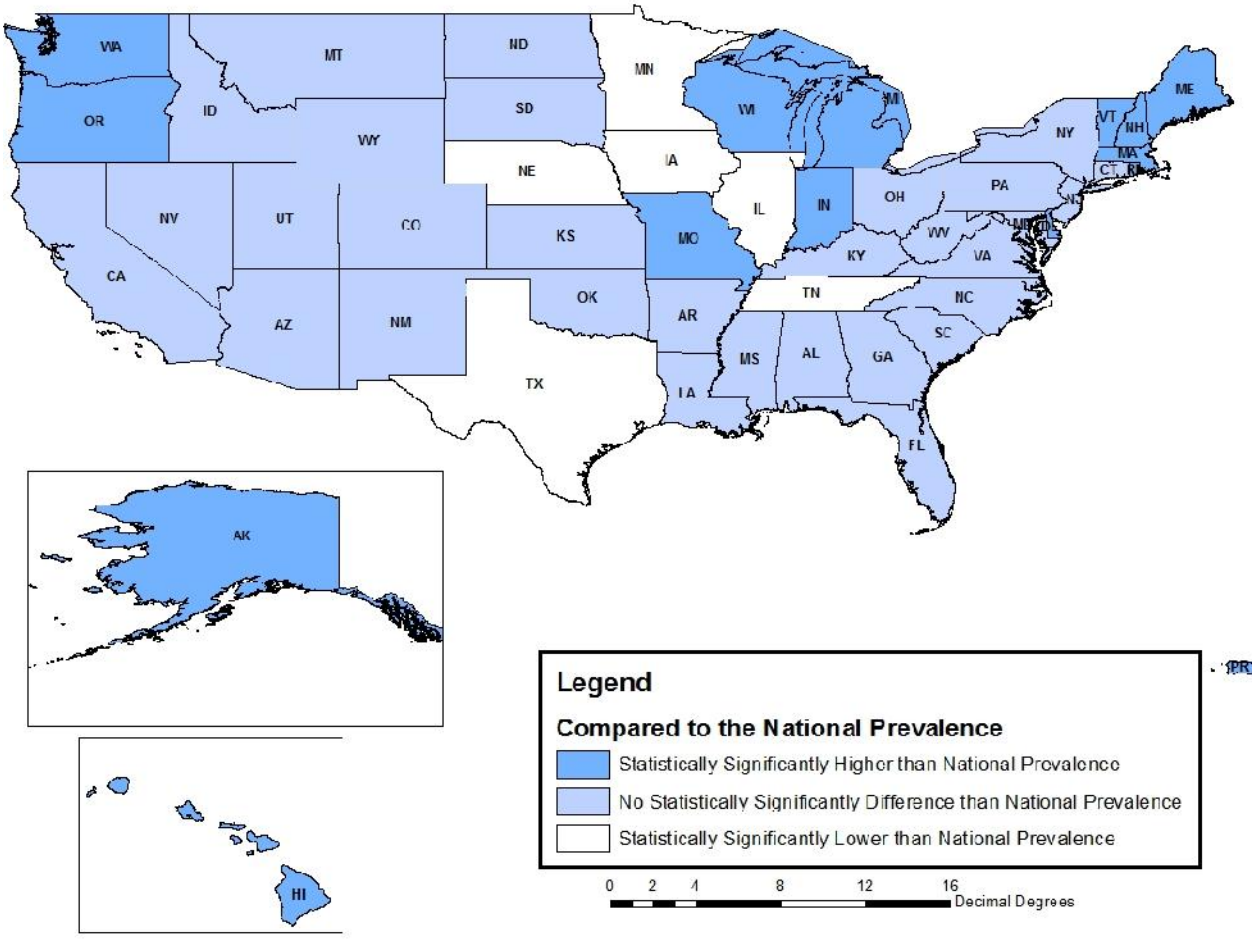
Statistical Testing: To determine if the prevalence of asthma follows an increasing or decreasing trend over time, trend analysis was conducted using the Joinpoint program. Joinpoint software (version 3.4.2), developed by the National Cancer Institute, was used to determine changes in estimates over time. The software is available at https://surveillance.cancer.gov/joinpoint/

Trends were described as statistically significantly increasing or decreasing only if the changes over time were statistically significant with a p-value of < 0.05.

Statistical Weighting: A technique used to ensure that a sample is representative of the population. Weights are assigned to data to account for differences in the probability of selection based on certain characteristics of the population such as age, race/ethnicity, sex, and geographic region

3. Asthma Prevalence among Adults

Map 1.1 Prevalence of Current Asthma among Adults in the United States by State, 2013

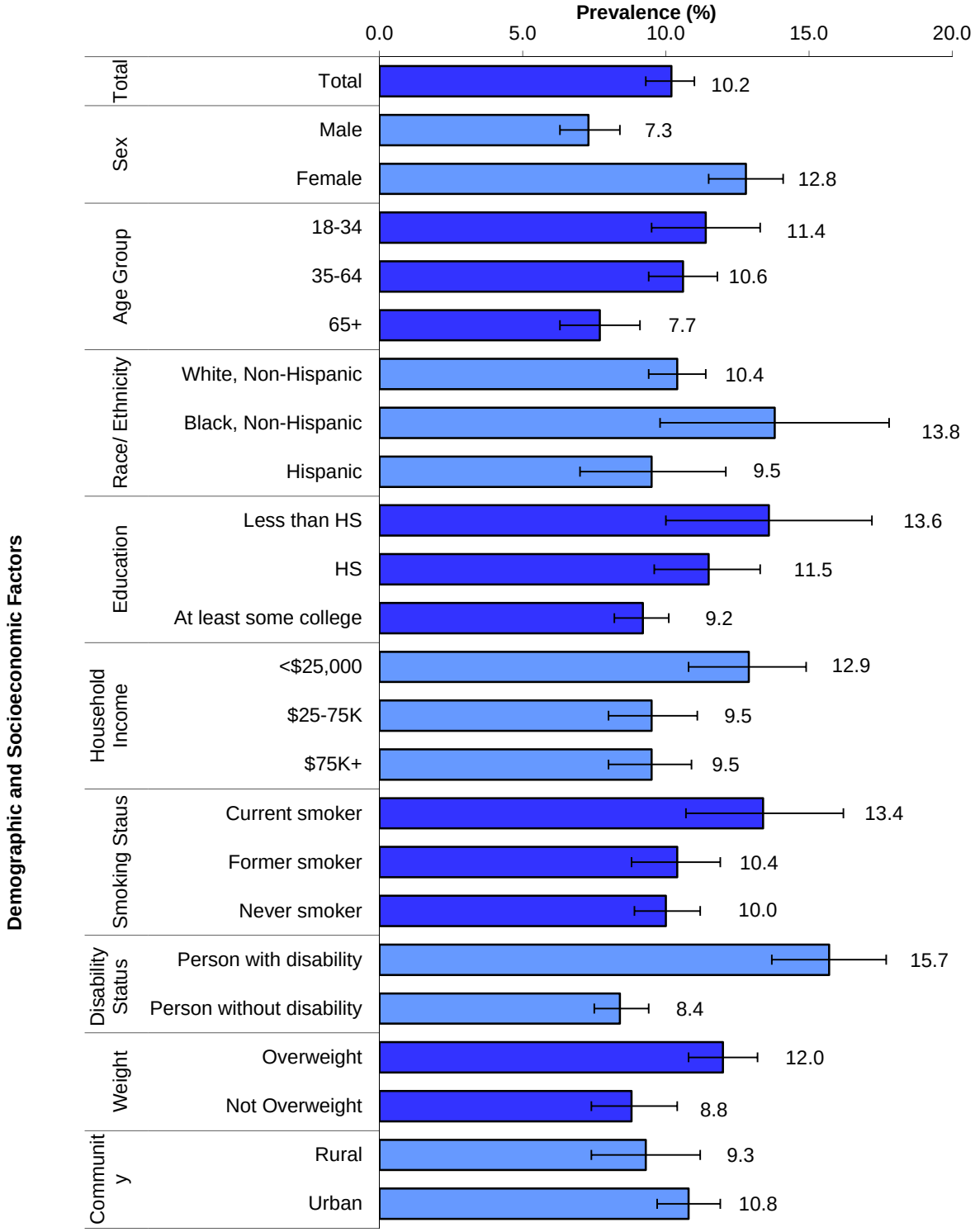


Data Source: 2013 CDC Behavioral Risk Factor Surveillance System

- The map above describes current asthma prevalence among adults in each state, compared to the national asthma prevalence. In 2013 the asthma prevalence among adults was 9.0% in the U.S. and 11.4% in Massachusetts.
- Current asthma prevalence among adults in Massachusetts, like most other states in the Northeast, was statistically significantly higher than the national average.

Current Asthma Prevalence among Adults 2015

Figure 1.1 Prevalence of Current Asthma among Massachusetts Adults by Demographic and Select Socioeconomic Factors, 2015



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

Table 1.1 Prevalence of Current Asthma among Massachusetts Adults by Demographic and Select Socioeconomic Factors, 2015

Demographic and Socioeconomic Factors		N[1]	%[2]	95% CI[3]
Total	Total	9205	10.2	9.3 - 11.0
Sex	Male	9205	7.3	6.3 - 8.4
	Female		12.8	11.5 - 14.1
Age Group	18-34	8998	11.4	9.5 - 13.3
	35-64		10.6	9.4 - 11.8
	65+		7.7	6.3 - 9.1
Race/ Ethnicity	White, Non-Hispanic	9180	10.4	9.4 - 11.4
	Black, Non-Hispanic		13.8	9.8 - 17.8
	Hispanic		9.5	7.0 - 12.1
Education	Less than HS	9134	13.6	10.0 - 18.5
	HS		11.5	9.6 - 13.0
	At least some college		9.2	8.2 - 10.1
Household Income	<$25,000	7162	12.9	10.8 - 14.9
	$25-75K		9.5	8.0 - 11.1
	$75K+		9.5	8.0 - 10.9
Smoking Status	Current smoker	8664	13.4	10.7 - 16.2
	Former smoker		10.4	8.8 - 11.9
	Never smoker		10.0	8.9 - 11.2
Disability Status	Person with disability	8677	15.7	13.7 - 17.7
	Person without disability		8.4	7.5 - 9.4
Weight	Overweight	8134	12.0	10.8 - 13.2
	Not Overweight		8.8	8.4 - 10.8
Type of Community	Rural	7973	9.3	7.4 - 11.2
	Urban		10.8	9.7 - 11.9

1. N is the number of respondents who answered the corresponding question(s).
2. Percent is weighted to population characteristics.
3. 95% Confidence interval.
Data Source: 2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health

- In 2015, the prevalence of current asthma among Massachusetts adults was 10.2%.
- A high asthma prevalence among adults is associated with:
  - Being female (12.8%)
  - Being between the ages of 18 and 64 (ages of 18-34: 11.4% and ages of 35-64: 10.6%)
  - Having less than a high school degree (13.6%)
  - Having an annual household income less than $25,000 (12.9%)
  - Being disabled (15.7%)
  - Being overweight (12.0%)
- Additionally, trend data on subsequent pages show that the prevalence of asthma is increasing faster among these groups.

Below is a detailed description of the demographic and socio-economic factors associated with high asthma prevalence estimates:

Sex: There is a statistically significant difference between the prevalence of asthma among males and females in Massachusetts. Females are 1.8 times more likely to have current asthma than males, at 12.8% versus 7.3%, respectively.

Age: Adults 18-34 and 35-64-years-old in Massachusetts are more likely to have asthma compared with adults age 65 and older: 11.4%, 10.6%, and 7.7%, respectively. There is a statistically significant difference between the prevalence of asthma among adults 18-64-years-old and adults 65 and older.

Education: Of Massachusetts adults without a high school degree or GED, 13.6% have asthma. This makes them 1.2 times more likely to have asthma than those who have a high school degree (11.5%), and 1.5 times more likely to have asthma than those who have completed at least some college (9.5%). There is a statistically significant difference between the prevalence of asthma among adults without a high school degree and adults with at least a college degree.

Household Income: There is a statistically significant difference between the prevalence of asthma among people in households that earn less than $25,000 per year, and those in households earning between $25,000 and $75,000, or more than $75,000 per year (12.9% vs. 9.5%, respectively). This makes those whose household income is less than $25,000 per year 1.3 times more likely to have asthma than those whose household income between $25,000 and $75,000 per year, and those whose yearly household income is above $75,000 each year.

Smoking status: There are statistically significant differences in the prevalence of asthma among current smokers and those who have never smoked. At 13.4%, adults in Massachusetts who currently smoke have the highest prevalence of asthma compared those who have never smoked (10.0%), and who only smoked before (10.4%). Adults who currently smoke are more than 1.3 times more likely to have asthma than those who have never smoked.

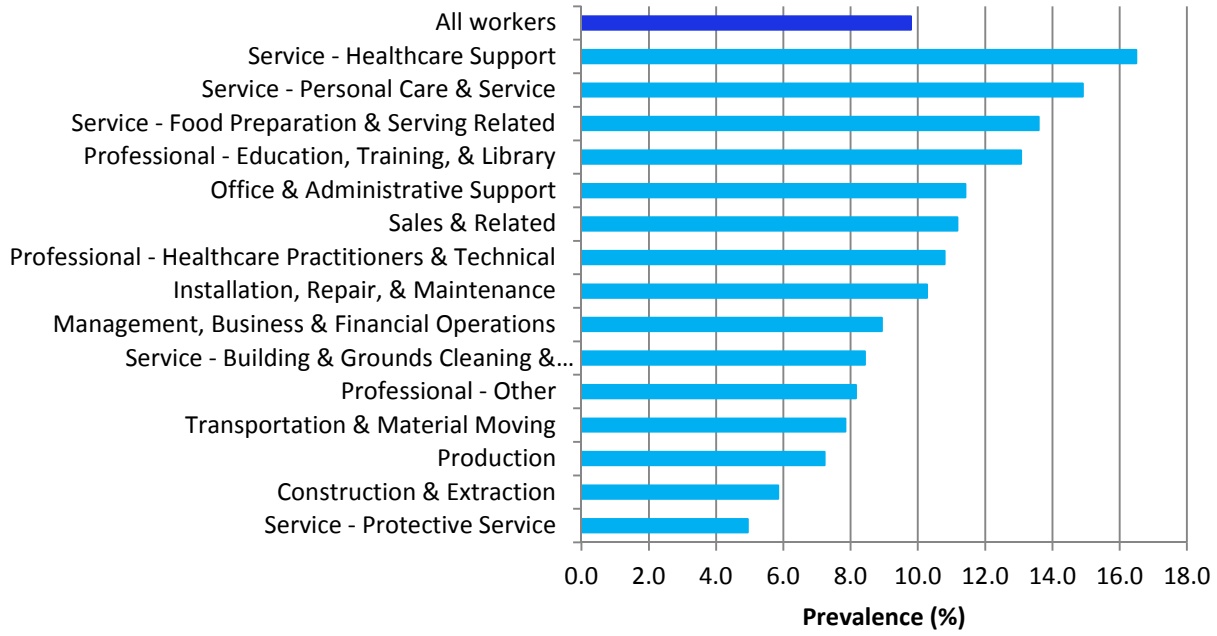
Disability status: At 15.7%, adults with disabilities have a higher prevalence of asthma compared to 8.4% of those without a disability. Adults in Massachusetts with a disability are 1.9 times more likely to have asthma compare to those without disability.

Weight: There is a higher prevalence of asthma in adults who are overweight, with 12.0% of overweight adults in Massachusetts having asthma compared to 8.8% of adults who are not overweight. This means overweight adults have 1.4 times the prevalence of asthma compared to those who are not overweight.

Current Asthma Prevalence among Adults by Industry and Occupation

Work is an important social determinant of health. Information about peoples' jobs can be used to target activities to protect and promote the health of working people. "Occupation" describes the kind of work a person does to earn a living (i.e., job title), whereas "industry" describes what a person's employer or business does. Information on both occupation and industry are key to accurately characterize work. The findings in this section are based on data collected in the landline and cell phone BRFSS surveys from 2012-2015. All BRFSS respondents who answered that they were currently employed for wages, self-employed, or out of work for less than one year were asked about their occupation and industry. The open-ended responses were coded by CDC's National Institute for Occupational Safety and Health using automated coding and trained staff. Occupation responses were each assigned a 4-digit 2002 Census Occupation Code (COC); industry responses were each assigned a 4-digit 2002 Census Industry Code (CIC). For analysis, coded responses were categorized into broader occupation and industry groups.

Figure 1.2 Prevalence of Current Asthma among Massachusetts Adults by Occupation, 2012-2015

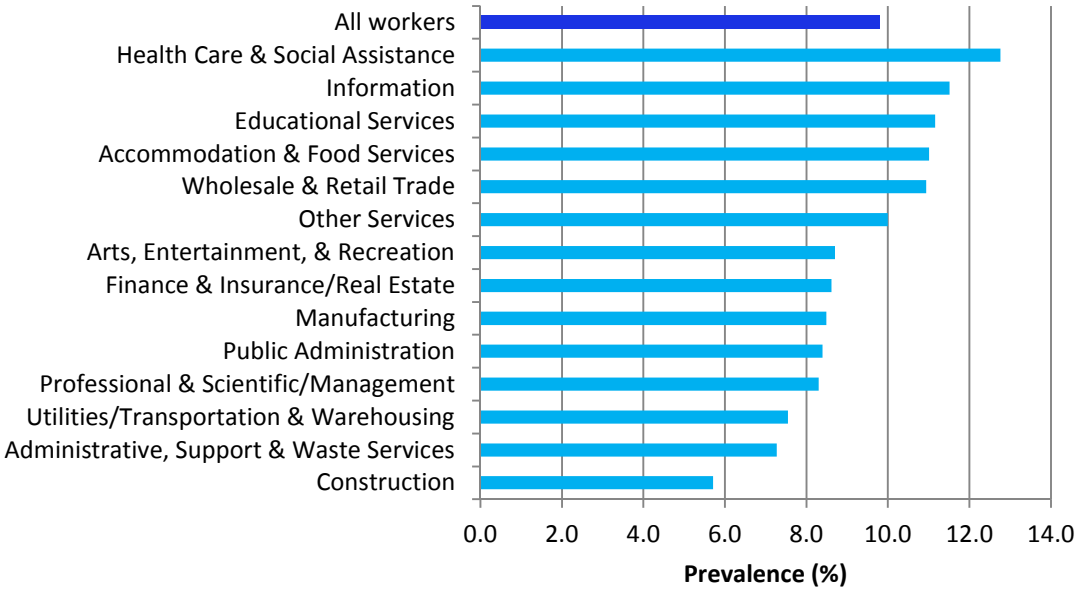


Occupation Group[1]	N[2]	%[3]	95% CI[4]
All workers	33,391	9.8	9.3 - 10.2
Service - Healthcare Support	758	16.5	12.2 - 20.8
Service - Personal Care & Service	851	14.9	10.8 - 19.0
Service - Food Preparation & Serving Related	760	13.6	9.9 - 17.3
Professional - Education, Training, & Library	2,732	13.1	11.1 - 15.0
Office & Administrative Support	3,113	11.4	9.7 - 13.1
Sales & Related	2,486	11.2	9.3 - 13.1
Professional - Healthcare Practitioners & Technical	2,995	10.8	9.2 - 12.4
Installation, Repair, & Maintenance	570	10.3	6.2 - 14.4
Management, Business & Financial Operations	4,514	8.9	7.7 - 10.2
Service - Building & Grounds Cleaning & Maintenance	765	8.4	5.4 - 11.5
Professional - Other	5,257	8.2	7.2 - 9.2
Transportation & Material Moving	956	7.8	5.2 - 10.5
Production	930	7.2	4.3 - 10.1
Construction & Extraction	1,121	5.8	3.8 - 7.9
Service - Protective Service	467	4.9	2.6 - 7.3

Note: 28,324 respondents who answered yes or no to current asthma were assigned occupation codes.
Insufficient data for Farming, Forestry, and Fishing.
1. Occupation classified using Census Occupation Codes (2002).
2. N is the number of respondents who answered the corresponding question(s).
3. Percent is weighted to population characteristics.
4. 95% Confidence interval.
Data Source: 2012-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health

- Overall, in 2012-2015, current asthma prevalence among Massachusetts workers was 9.8%.
- Service - Healthcare Support (16.5%); Service - Personal Care & Service (14.9%); and Professional - Education, Training, & Library (13.1%) were among the occupation groups with the highest estimates of current asthma prevalence. These three groups had significantly higher prevalence compared to all workers (9.8%).
- The Construction & Extraction (5.8%) and Service - Protective Service (4.9%) occupation groups had the lowest prevalence; prevalence estimates for these groups were significantly lower than that for all workers (9.8%)

Figure 1.3 Prevalence of Current Asthma among Massachusetts Adults by Industry, 2012-2015



Industry Group[1]	N[2]	%[3]	95% CI[4]
All workers	33,391	9.8	9.3 - 10.2
Health Care & Social Assistance	6,263	12.8	11.4 - 14.1
Information	778	11.5	8.0 - 15.1
Educational Services	4,155	11.2	9.7 - 12.6
Accommodation & Food Services	1,006	11.0	8.4 - 13.6
Wholesale & Retail Trade	2,644	10.9	9.1 - 12.8
Other Services	1,456	10.0	7.8 - 12.2
Arts, Entertainment, & Recreation	529	8.7	5.3 - 12.1
Finance & Insurance/Real Estate	2,272	8.6	6.9 - 10.4
Manufacturing	2,596	8.5	6.8 - 10.2
Public Administration	1,536	8.4	6.3 - 10.5
Professional & Scientific/Management	2,684	8.3	6.9 - 9.7
Utilities/Transportation & Warehousing	990	7.5	5.3 - 9.8
Administrative, Support & Waste Services	710	7.3	4.5 - 10.1
Construction	1,495	5.7	3.9 - 7.5

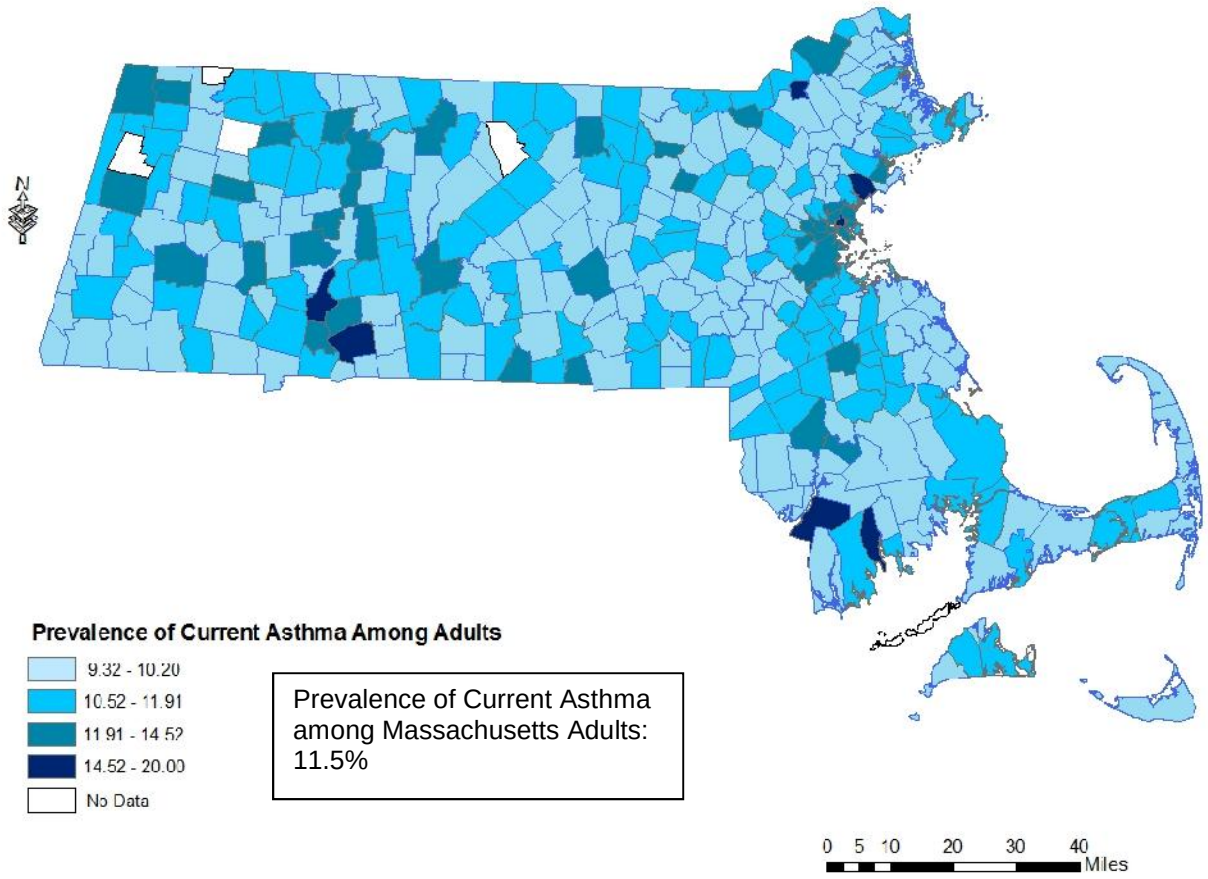
Note: 29,257 respondents who answered yes or no to current asthma were assigned industry codes.
Insufficient data for Agriculture, Forestry, Fishing and Hunting and Mining, Quarrying, and Oil and Gas Extraction
1. Industries classified using North American Industry Classification System (2002).
2. N is the number of respondents who answered the corresponding question(s).
3. Percent is weighted to population characteristics.
4. 95% Confidence interval.
Data Source: 2012-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- The Health Care and Social Assistance (12.8%) industry group had the highest prevalence of current asthma; this prevalence was significantly higher than that for all workers (9.8%).
- The Construction industry had the lowest prevalence (5.7%), which was significantly lower than that for all workers (9.8%).

Current Asthma Prevalence among MA Adults by Sub-State Geographic Area

The MDPH Asthma Prevention and Control Program, in collaboration with the University of Massachusetts Medical School and the CDC, utilized a methodology called “Small Area Estimation,” to estimate community-level, current asthma prevalence among adults. More detail about this methodology can be found below. Massachusetts is the first state to produce community-level estimates of asthma prevalence for adults. Community-level asthma prevalence for adults could not be estimated for some cities and towns due to limited sample size.

Map 1.2 Prevalence of Current Asthma among Massachusetts Adults by City/Town, 2013- 2015



Data Source: 2013-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

Method of Small Area Estimation

Multi-level, mixed effects logistic regression models were adapted to estimate community-level, current asthma prevalence among adults in MA. The models estimate community-level current asthma prevalence based on associations between the respondents' current asthma status and individual-level and community-level socioeconomic characteristics, taking into account community demographics. Individual-level characteristics in the models include: sex, race/ethnicity, and age. Community-level characteristics in the models include: percentage of residents below poverty level, race/ethnicity composition, median age of homes in the community, housing costs, and density of major highways.

- Current asthma prevalence among adults in Massachusetts cities and towns ranged from 9.3% to 20.0%.
- 16.8% of Massachusetts cities and towns for which data is available had current asthma prevalence estimates exceeding the 2013-2015 state average (11.5%).
- The highest current asthma prevalence estimates in Massachusetts were seen in and around densely populated areas, including, but not limited to, Boston, Springfield, Worcester, Lowell, New Bedford, and Fall River.

Table 1.2 Massachusetts Communities with Highest Asthma Prevalence, 2013-2015

Community	%[1]	95% CI[2]
AMHERST	13.85	11.29 - 16.88
BOSTON	13.45	11.65 - 15.50
BROCKTON	13.67	11.77 - 15.82
CHELSEA	16.93	13.84 - 20.53
CHICOPEE	14.14	11.84 - 16.80
FALL RIVER	16.36	13.74 - 19.36
FITCHBURG	14.04	11.61 - 16.86
HOLYOKE	20.00	16.44 - 24.09
LAWRENCE	19.17	15.91 - 22.90
LOWELL	14.52	12.39 - 16.94
LYNN	16.42	14.23 - 18.87
NEW BEDFORD	15.48	13.54 - 17.65
REVERE	13.42	11.06 - 16.18
SPRINGFIELD	17.35	15.06 - 19.91
WORCESTER	14.28	12.37 - 16.44

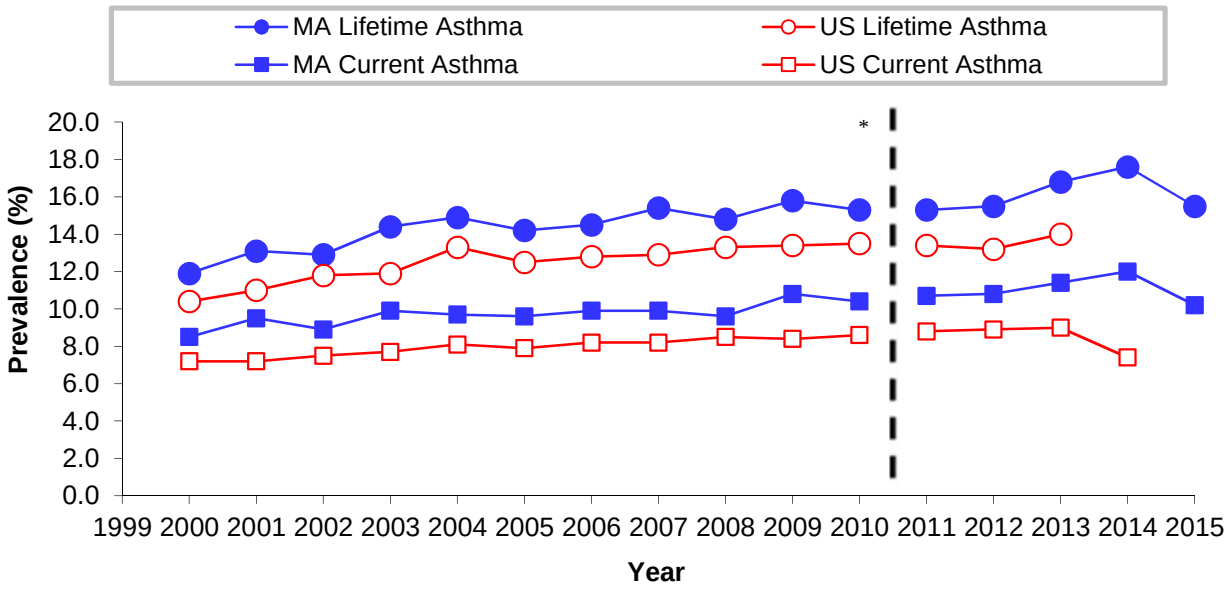
1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
Data Source: 2013-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

(Contact Asthma Prevention and Control Program for the complete table)

Trend of Asthma Prevalence among Adults

The annual prevalence of current asthma in adults between 2000 and 2015 were estimated. Trend analyses are also presented when possible to assess any changes in prevalence that may have occurred over time. An increasing trend in prevalence suggested that current asthma burden may rise in the near future.

Figure 1.4 United States and Massachusetts Trend in Prevalence of Lifetime and Current Asthma among Adults, 2000-2015



Data Sources: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health
US Data: 2000-2014 U.S. Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention.
States include District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands in applicable years.
*Note: ---- Indicates the data after 2011 had a new weighting method.

- In 2015, lifetime and current asthma prevalence among Massachusetts adults was 15.5% and current asthma prevalence was 10.2%.
- The prevalence of lifetime and current asthma among adults was higher in Massachusetts than in the U.S. for each year examined, from 2000 through 2013, though it could not be determined if this difference was statistically significant. Due to a new weighting methodology applied in 2011, trend analyses cannot be performed from 2011 to 2015.
    - From 2000 through 2010, there were statistically significant increases in the prevalence of both lifetime and current asthma in Massachusetts and the U.S.
    - From 2000 to 2010, the prevalence of lifetime asthma in Massachusetts increased 28.6% (slope = 0.32, p= 0.0002) and current asthma increased 22.4% (slope = 0.15, p= 0.0027) among adults.

    - During this time, the prevalence of lifetime asthma in the U.S. increased 29.8% (slope = 0.28, $p < 0.0001$) and current asthma increased 19.4% (slope = 0.14, $p < 0.0001$) among adults.
    - After 2011, the prevalence of lifetime and current asthma in Massachusetts is still increasing. However, more years of data are needed to accurately estimate the speed of increase.
- As of 2015 in Massachusetts, an estimated 836,000 adults had asthma in their lifetime and 547,000 adults had a current asthma.
- Of Massachusetts adults with lifetime asthma in 2015, 65.4% reported that they still had asthma (i.e., current asthma).

Table 1.3 United States and Massachusetts Prevalence Trends of Lifetime and Current Asthma among Adults, 2000-2015

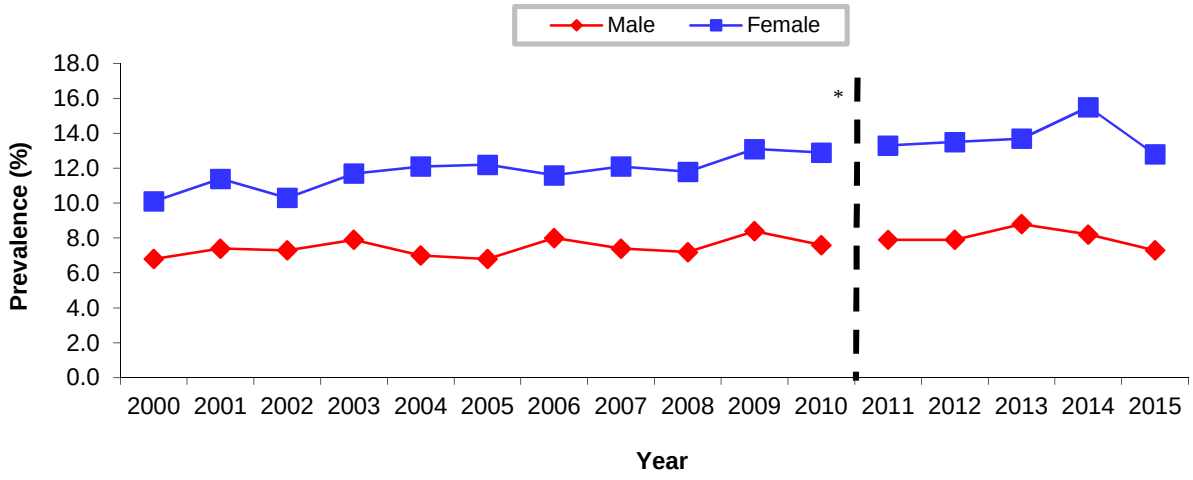
	Lifetime Asthma					Current Asthma				
	Massachusetts				U.S.	Massachusetts				U.S.
Year	N[1]	%[2]	95% CI[3]	Estimated Number of People[4]	%[2]	N[1]	%[2]	95% CI[3]	Estimated Number of People[4]	%[2]
2000	8,139	11.9	11.0 - 12.8	566,500	10.4	8,122	8.5	7.8 - 9.2	403,200	7.2
2001	8,614	13.1	12.2 - 13.9	639,100	11.0	8,589	9.5	8.7 - 10.3	462,300	7.2
2002	7,417	12.9	11.9 - 13.9	629,200	11.8	7,398	8.9	8.1 - 9.8	433,900	7.5
2003	7,569	14.4	13.3 - 15.4	710,300	11.9	7,548	9.9	9.0 - 10.8	488,400	7.7
2004	8,182	14.9	13.9 - 15.9	743,200	13.3	8,148	9.7	8.8 - 10.5	479,000	8.1
2005	8,889	14.2	13.1 - 15.2	703,000	12.5	8,851	9.6	8.8 - 10.5	476,800	7.9
2006	12,692	14.5	13.5 - 15.5	720,500	12.8	12,643	9.9	9.0 - 10.7	487,800	8.2
2007	21,449	15.4	14.6 - 16.2	759,400	12.9	21,355	9.9	9.2 - 10.5	484,100	8.2
2008	20,520	14.8	14.0 - 15.6	738,000	13.3	20,451	9.6	8.9 - 10.3	477,500	8.5
2009	16,679	15.8	14.7 - 16.8	792,500	13.4	16,598	10.8	9.9 - 11.7	540,200	8.4
2010	16,271	15.3	14.4 - 16.3	781,200	13.5	16,215	10.4	9.6 - 11.1	525,700	8.6
* 2011	22,262	15.3	14.5 - 16.2	785,500	13.4	22,192	10.7	10.0 - 11.4	545,700	8.8
2012	21,723	15.5	14.7 - 16.3	806,400	13.2	21,550	10.8	10.2 - 11.5	560,800	8.9
2013	15,033	16.8	15.8 - 17.8	888,800	14.0	14,968	11.4	10.5 - 12.2	598,700	9.0
2014	15,589	17.6	16.6 - 18.6	939,600		15,510	12.0	11.1 - 12.8	636,100	7.4
2015	9,250	15.5	14.5 - 16.5	836,100		9,205	10.2	9.3 - 11.0	547,000	
Trend Analysis (2000-2010)	**Slope[5]** 0.32		**95% CI[3]** (0.22 – 0.42)		**Slope[5] (95% CI[3])** 0.28 (0.20 – 0.36)	**Slope[5]** 0.15		**95% CI[3]** (0.07 – 0.23)		**Slope[5] (95% CI[3])** 0.14 (0.12 – 0.16)
			P – Value[6] 0.0002		**P - Value[6]** 0.0001			**P - Value[6]** 0.0027		**P - Value[6]** <.0001

1. N is the number of respondents who answered the corresponding question(s).
2. Percent is weighted to population characteristics.
3. 95% Confidence interval.
4. Prevalence numbers are population estimates.
5. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for 2000 through 2010.
6. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Sources: MA data: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health;
US Data: 2000-2013 U.S. Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention.
States include District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands in applicable years.

Figure 1.5 Prevalence of Current Asthma among Massachusetts Adults by Sex, 2000-2015



Year	N [1]	Male		Female	
		% [2]	95% CI [3]	% [2]	95% CI [3]
2000	8,122	6.8	5.7 - 7.8	10.1	9.0 - 11.1
2001	8,589	7.4	6.3 - 8.5	11.4	10.3 - 12.5
2002	7,398	7.3	6.1 - 8.6	10.3	9.2 -11.5
2003	7,548	7.9	6.7 - 9.2	11.7	10.5 - 12.9
2004	8,148	7.0	5.8 - 8.1	12.1	10.9 - 13.3
2005	8,851	6.8	5.6 - 8.0	12.2	10.9 - 13.5
2006	12,643	8.0	6.6 - 9.3	11.6	10.6 - 12.7
2007	21,355	7.4	6.5 - 8.4	12.1	11.2 - 12.9
2008	20,451	7.2	6.3 - 8.2	11.8	10.9 - 12.7
2009	16,598	8.4	7.1 - 9.6	13.1	11.8 - 14.3
2010	16,215	7.6	6.6 - 8.6	12.9	11.8 - 13.9
*					
2011	22,192	7.9	6.9 - 8.9	13.3	12.3 - 14.3
2012	21,550	7.9	7.0 - 8.1	13.5	12.5 - 14.5
2013	15,008	8.8	7.7 - 9.9	13.7	12.4 - 14.9
2014	15,508	8.2	7.1 - 9.3	15.5	14.2 - 16.7
2015	9,203	7.3	6.3 - 8.4	12.8	11.5 - 14.1
Trend Analysis (2000-2010)		**Slope [4]**	**95% CI [3]**	**Slope [4]**	**95% CI [3]**
		0.06	-0.02 - 0.14	0.23	0.13 - 0.32
		P - Value [5]		**P - Value [5]**	
		0.1659		0.0013	

1. N is the number of respondents who answered the corresponding question(s).
2. Percent is weighted to population characteristics.
3. 95% Confidence interval.
4. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for 2000 through 2010.
5. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

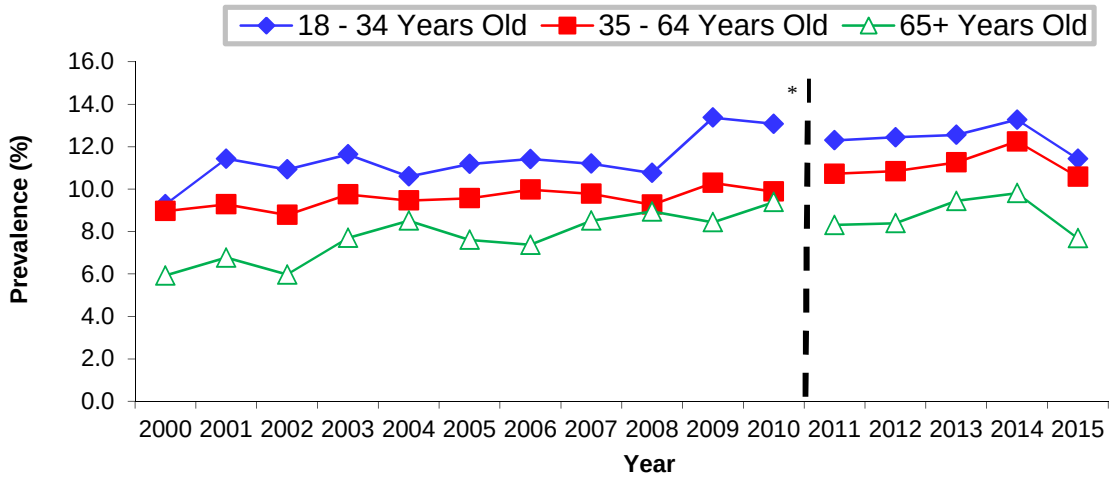
*Note: ---- Indicates the data after 2011 had a new weighting method.
Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

In 2015, the prevalence of current asthma was 7.3% and 12.8% among Massachusetts male and female adults, respectively.

In each year, from 2000 through 2015, the prevalence of current asthma was consistently higher among female adults, compared to male adults.

- From 2000 to 2010, the prevalence of current asthma increased significantly (27.7%) among females (slope = 0.23, p = 0.0013), but did not significantly change among males (slope = 0.06, p = 0.1659).
- In 2015, an estimated 190,000 adult males and 360,000 adult females had current asthma (data not shown).

Figure 1.6 Prevalence of Current Asthma among Massachusetts Adults by Age, 2000-2015



Year	18 – 34 Years old		35 – 64 Years Old		65+ Year Old	
	% [1]	95% CI [2]	% [1]	95% CI [2]	% [1]	95% CI [2]
2000	9.3	7.9 - 10.7	9.0	7.9 - 10.0	5.9	4.5 - 7.3
2001	11.4	9.7 - 13.1	9.3	8.2 - 10.3	6.8	5.3 - 8.3
2002	10.9	9.0 - 12.8	8.8	7.7 - 9.9	6.0	4.5 - 7.5
2003	11.6	9.8 - 13.5	9.8	8.6 - 10.9	7.7	6.0 - 9.4
2004	10.6	8.7 - 12.5	9.5	8.4 - 10.5	8.5	6.8 - 10.3
2005	11.2	9.0 - 13.4	9.6	8.5 - 10.6	7.6	6.1 - 9.2
2006	11.4	9.2 - 13.7	10.0	9.1 - 10.9	7.4	6.2 - 8.6
2007	11.2	9.4 - 13.0	9.8	9.0 - 10.5	8.5	7.5 - 9.5
2008	10.8	9.0 - 12.5	9.3	8.6 - 10.0	8.9	7.9 - 10.0
2009	13.4	10.8 - 15.9	10.3	9.5 - 11.1	8.4	7.3 - 9.6
2010 *	13.1	10.7 - 15.4	9.9	9.0 - 10.8	9.4	8.2 - 10.6
2011	12.3	10.4 - 14.2	10.7	9.9 - 11.5	8.3	7.2 - 9.4
2012	12.4	10.8 - 14.1	10.8	10.0 - 11.7	8.4	7.3 - 9.5
2013	12.6	10.5 - 14.6	11.3	10.2 - 12.3	9.4	8.2 - 10.7
2014	13.3	11.2 - 15.3	12.2	11.2 - 13.3	9.8	8.5 - 11.1
2015	11.4	9.5 - 13.3	10.6	9.4 - 11.8	7.7	6.3 - 9.1

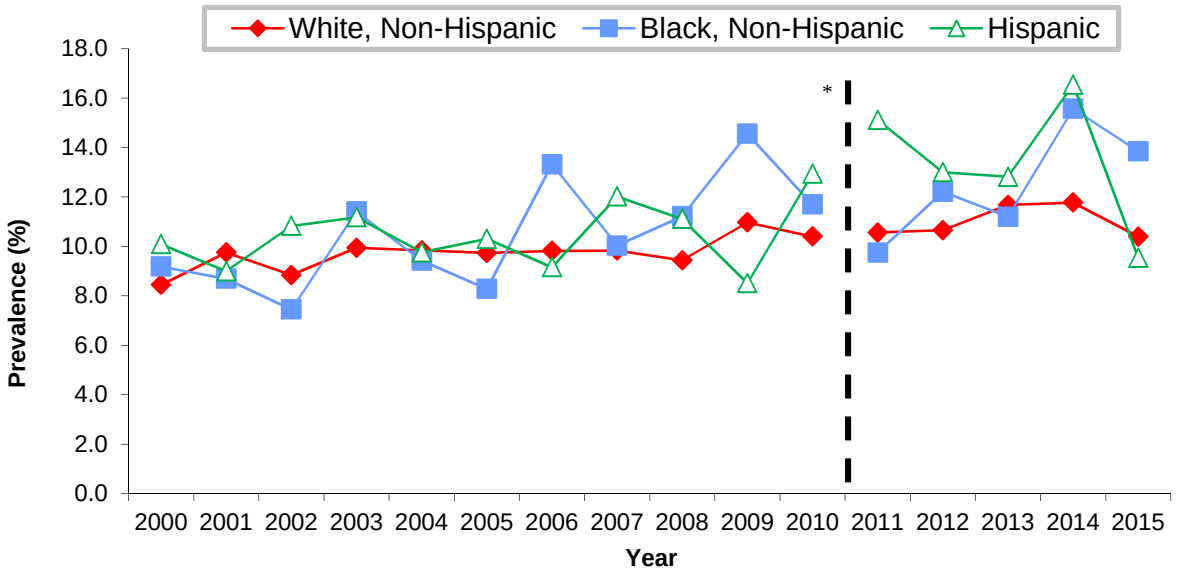
Trend Analysis (2000-2010)	Slope[3]	95% CI[2]	Slope[3]	95% CI[2]	Slope[3]	95% CI[2]
	0.22	0.06 - 0.38	0.09	0.02 - 0.16	0.31	0.21 - 0.41
	P – Value[4]		P - Value[4]		P - Value[4]	
	0.0247		0.0267		0.0002	

1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for 2000 through 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.
Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, the prevalence of current asthma was 11.4% among Massachusetts adults aged 18-34, 10.6% among those aged 35-64, and 7.7% among those aged 65+.
- In each year, from 2000 through 2015, Massachusetts adults aged 18-34 years consistently had the highest prevalence of current asthma.
- From 2000 through 2010, the prevalence of asthma among adults aged 65+ increased 59.3% (slope=0.31, p=0.0002), from 5.9% to 9.4%.
- Current asthma prevalence in adults aged 65+ increased 1.4 times faster than adults aged 18-34, and 3.4 times faster than adults aged 35-64, at an average rate of 0.31 percentage points per year from 2000 to 2010.

Figure 1.7 Prevalence of Current Asthma among Massachusetts Adults by Race/Ethnicity, 2000-2015



Year	White, Non-Hispanic		Black, Non-Hispanic		Hispanic	
	%[1]	95% CI [2]	%[1]	95% CI [2]	%[1]	95% CI [2]
2000	8.4	7.6 - 9.2	9.2	5.8 - 12.6	10.1	7.5 - 12.7
2001	9.8	8.9 - 10.6	8.7	5.7 - 11.7	9.0	6.5 - 11.5
2002	8.8	7.9 - 9.8	7. 5	3.2 - 11.7	10.8	7.7 - 13.9
2003	9.9	9.0 - 10.9	11.4	6.7 - 16.1	11.2	7.9 - 14.5
2004	9.8	8.9 - 10.8	9.4	6.0 - 12.8	9.8	6.5 - 13.0
2005	9.7	8.8 - 10.7	8.3	5.0 - 11.5	10.3	6.9 - 13.7
2006	9.8	8.7 - 10.8	13.3	8.8 - 17.9	9.2	7.0 - 11.3
2007	9.8	9.1 - 10.5	10.0	7.3 - 12.8	12.0	9.5 - 14.5
2008	9.4	8.7 - 10.2	11.2	7.4 - 15.0	11.1	8.9 - 13.3
2009	11.0	10.0 -12.0	14.6	10.1 - 19.0	8.5	6.5 - 10.5
2010	10.4	9.6 - 11.2	11.7	7.8 - 15.5	12.9	10.0 - 15.8
* 2011	10.6	9.8 - 11.4	9.7	7.2 - 12.3	15.1	12.0 - 18.3
2012	10.7	9.9 - 11.4	12.2	9.5 - 14.9	13.0	10.8 - 15.2
2013	11.7	10.7 - 12.7	11.2	7.7 - 14.7	12.8	10.2 - 15.4
2014	11.8	10.8 - 12.7	15.6	11.5 - 19.6	16.6	12.9 - 20.2
2015	10.4	9.4 - 11.9	13.9	9.9 - 17.8	9.5	7.0 - 12.1
Trend Analysis (2000-2010)	**Slope[3]**	**95% CI**	**Slope[3]**	**95% CI**	**Slope[3]**	**95% CI**
	0.14	0.05 - 0.23	0.38	0.09 - 0.67	0.07	-0.19 - 0.34
	P - Value[4]		**P - Value[4]**		**P - Value[4]**	
	0.0158		0.0285		0.5950	

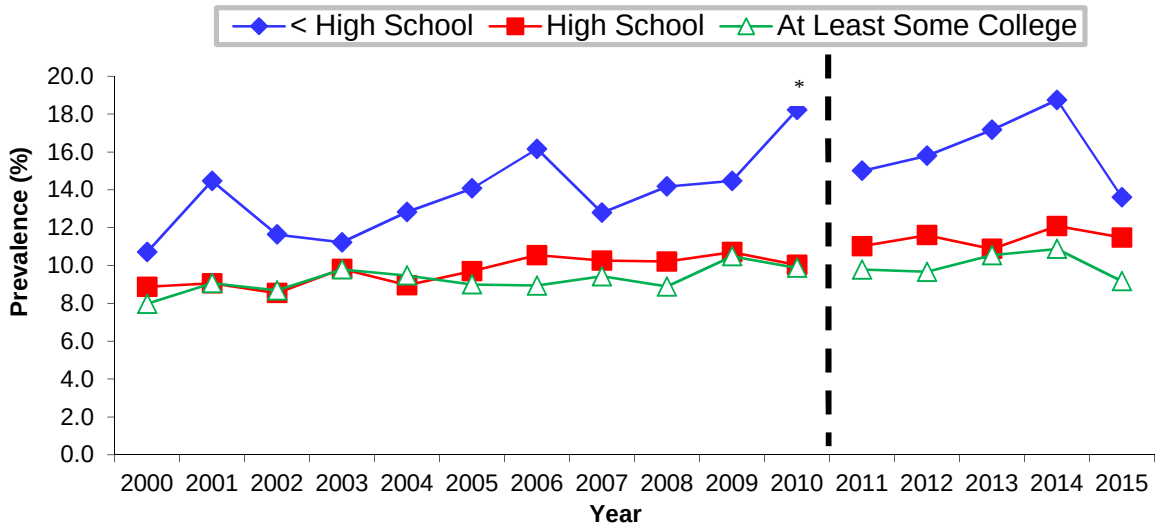
1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for 2000 through 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, the prevalence of current asthma in Massachusetts was 10.7% among White, Non-Hispanic adults, 12.2% among Black, Non-Hispanic adults, and 13.0% among Hispanic adults.
- From 2000 through 2010, current asthma prevalence increased among all groups but the increase was not statistically significant among Hispanic adults.

Figure 1.8 Prevalence of Current Asthma among Massachusetts Adults by Education Level, 2000-2015



	Less than High School		High School		At Least Some College	
Year	% [1]	95% CI [2]	% [1]	95% CI [2]	% [1]	95% CI [2]
2000	10.7	8.2 - 13.3	8.9	7.4 - 10.3	8.0	7.1 - 8.9
2001	14.5	11.2 - 17.7	9.1	7.5 - 10.6	9.1	8.1 - 10.0
2002	11.6	8.5 - 14.8	8.5	6.9 - 10.2	8.7	7.6 - 9.7
2003	11.2	8.2 - 14.2	9.8	8.1 - 11.5	9.8	8.7 - 10.9
2004	12.8	8.7 - 12.5	9.0	7.3 - 10.6	9.5	8.5 - 10.5
2005	14.1	9.1 - 16.6	9.7	8.0 - 11.4	9.0	8.0 - 10.0
2006	16.2	9.3 - 18.8	10.5	8.7 - 12.3	8.9	8.0 - 9.9
2007	12.8	13.0 - 19.3	10.3	8.9 - 11.6	9.4	8.7 - 10.2
2008	14.2	10.3 - 15.3	10.2	8.8 - 11.6	8. 9	8.2 - 9.6
2009	14.5	10.6 - 17.7	10.7	8.9 - 12.5	10.5	9.4 - 11.6
2010	18.2	11.1 - 17.7	10.0	8.5 - 11.6	9.9	9.0 - 10.7
*						
2011	15.0	14.3 - 22.2	11.0	9.5 - 12.5	9.8	9.0 - 10.6
2012	15.8	13.1 - 18.5	11.6	10.2 - 13.0	9.7	8.9 - 10.4
2013	17.2	13.3 - 21.0	10.9	9.2 - 12.5	10.5	9.6 - 11.5
2014	18.7	14.9 - 22.6	12.1	10.4 - 13.8	10.9	10.0 - 11.8
2015	13.6	10.0 - 17.2	11.5	9.6 - 13.3	9.2	8.2 - 10.1
	Slope [3]	95% CI [2]	Slope [3]	95% CI [2]	Slope [3]	95% CI [2]
Trend Analysis (2000-2010)	0.44	0.13 - 0.74	0.18	0.10 - 0.25	0.12	0.03 - 0.22
	P - Value [4]		P - Value [4]		P - Value [4]	
	0.0205		0.0016		0.0351	

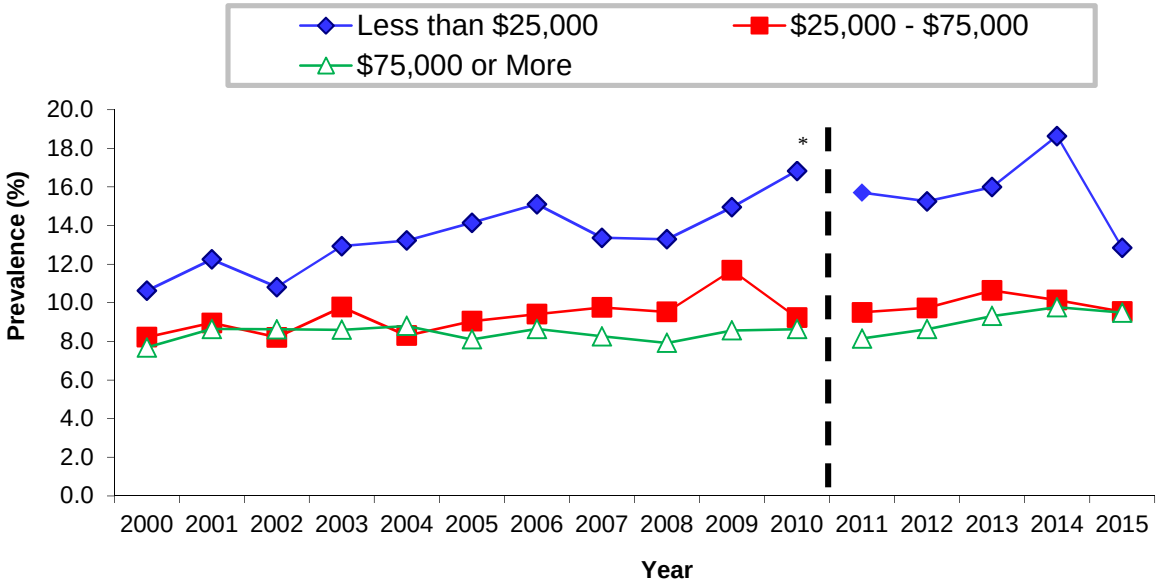
1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for though year 2000 to year 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, the prevalence of current asthma in Massachusetts was 13.6% among adults who did not graduate from high school, 11.5% among those with a high school diploma, and 9.2% among those with some college or more.
- In 2015, Massachusetts adults who did not graduate from high school had the highest prevalence of current asthma compared to those of other education levels.
- From 2000 through 2010, the prevalence of current asthma among adults who completed at least some college increased 23.8%.

Figure 1.9 Prevalence of Current Asthma among Massachusetts Adults by Household Income, 2000-2015



Year	Less than $25,000		$25,000 - $75,000		$75,000 or More	
	% [1]	95% CI [2]	% [1]	95% CI [2]	% [1]	95% CI [2]
2000	10.6	8.9 - 12.4	8.2	7.1 - 9.3	7.7	6.1 - 9.2
2001	12.3	10.2 - 14.3	9.0	7.7 - 10.2	8.6	7.1 - 10.2
2002	10.8	8.8 - 12.9	8.2	6.9 - 9.5	8.6	7.0 - 10.3
2003	12.9	10.7 - 15.2	9.8	8.4 - 11.2	8.6	7.0 - 10.1
2004	13.2	11.2 - 15.3	8.3	7.0 - 9.6	8.8	7.3 - 10.3
2005	14.1	11.6 - 16.7	9.1	7.7 - 10.4	8.1	6.8 - 9.4
2006	15.1	12.8 - 17.4	9.4	8.1 - 10.7	8.6	7.1 - 10.2
2007	13.4	11.7 - 15.1	9.8	8.6 - 10.9	8.3	7.3 - 9.2
2008	13.3	11.7 - 14.9	9.5	8.5 - 10.6	7.9	6.9 - 8.9
2009	14.9	12.6 - 17.3	11.7	10.0 - 13.4	8.6	7.3 - 9.9
2010	16.8	14.7 - 19.0	9.2	8.0 - 10.4	8.6	7.5 - 9.8
* 2011	15.7	13.8 -17.6	9.5	8.4 - 10.7	8.1	7.1 - 9.2
2012	15.3	13.6 -16.9	9.7	8.6 - 10.9	8.6	7.6 - 9.7
2013	15.3	13.6 - 16.9	10.6	9.1 - 12.2	9.3	8.0 - 10.6
2014	16.0	13.9 - 18.1	10.1	8.8 - 11.5	9.8	8.5 - 11.0
2015	18.6	16.3 - 21.0	9.5	8.0 - 11.1	9.5	8.0 - 10.9
Trend Analysis (2000-2010)	**Slope [3]**	**95% CI**	**Slope [3]**	**95% CI**	**Slope [3]**	**95% CI**
	0.44	0.26 - 0.63	0.16	0.03 - 0.28	0.01	-0.07 - 0.08
	P - Value [4]		**P - Value [4]**		**P - Value [4]**	
	0.0012		0.0338		0.8798	

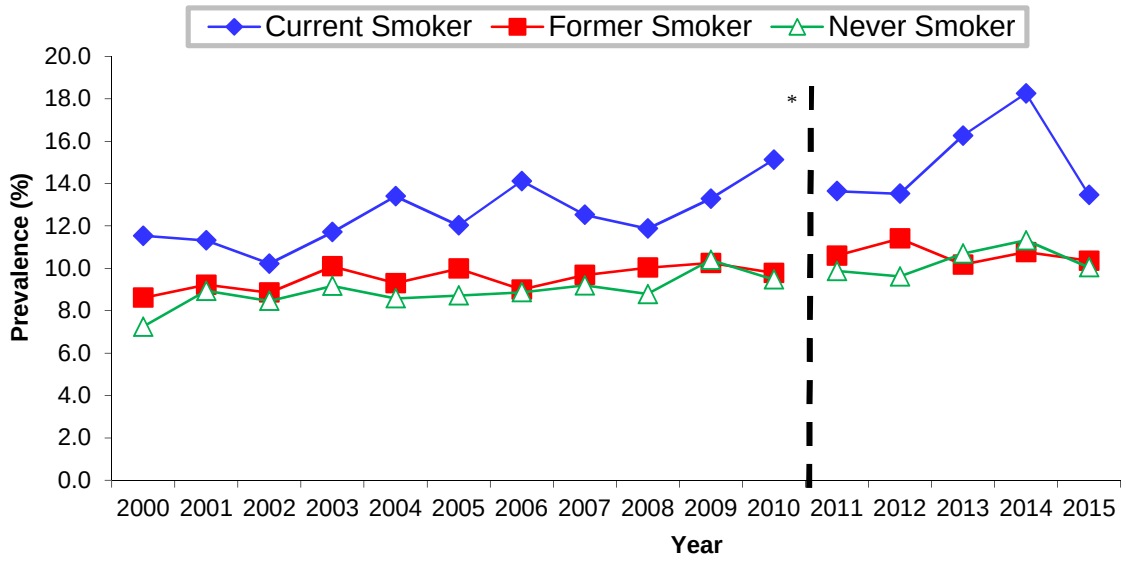
1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for though year 2000 to year 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, the prevalence of current asthma in Massachusetts was 18.6% among adults with annual household incomes below $25,000, and 9.5% for both those with annual household incomes between $25,000 and $75,000, and those with annual household incomes greater than $75,000.
- In each year, from 2000 through 2015, Massachusetts adults with annual household incomes less than $25,000 consistently had the highest asthma prevalence compared to other income categories, although the differences were not always statistically significant.
- From 2000 through 2010, the prevalence of current asthma increased 58.5% among adults in households with annual incomes below $25,000.

Figure 1.10 Prevalence of Current Asthma among Massachusetts Adults by Smoking Status, 2000-2015



Year	Current Smoker		Former Smoker		Never Smoker	
	% [1]	95% CI [2]	% [1]	95% CI [2]	% [1]	95% CI [2]
2000	11.5	9.6 - 13.4	8.6	7.2 -10.0	7.2	6.3 - 8.2
2001	11.3	9.3 - 13.4	9.2	7.8 -10.6	8.9	7.9 -10.0
2002	10.2	8.0 - 12.5	8.9	7.4 -10.3	8.5	7.3 - 9.6
2003	11.7	9.5 - 13.9	10.1	8.6 -11.6	9.2	8.0 -10.4
2004	13.4	10.9 - 15.9	9.3	7.9 -10.7	8.6	7.5 - 9.7
2005	12.0	9.5 - 14.5	10.0	8.4 -11.5	8.7	7.6 - 9.9
2006	14.1	11.3 - 17.0	9.0	7.8 -10.2	8.9	7.8 - 9.9
2007	12.5	10.6 - 14.4	9.7	8.7 -10.6	9.2	8.3 - 10.1
2008	11.9	10.0 - 13.8	10.0	8.9 -11.2	8.8	7.9 - 9.7
2009	13.3	11.0 - 15.6	10.2	8.9 -11.6	10.4	9.1 -11.7
2010	15.1	12.7 - 17.6	9. 8	8.6 -11.0	9.5	8.5 -10.4
*						
2011	13.6	11.6 - 15.7	10.6	9.4 -11.8	9.9	8.9 - 10.8
2012	13.5	11.7 - 15.4	11.4	10.2 -12.6	9.6	8.7 - 10.5
2013	16.3	13.7 - 18.8	10.2	8.6 -11.7	10.7	9.5 - 11.9
2014	18.3	15.2 - 21.3	10.8	9.4 -12.1	11.3	10.2 - 12.4
2015	13.5	10.7 - 16.2	10.4	8.8 -11.9	10.0	8.9 - 11.2
Trend Analysis (2000-2010)	**Slope [3]**	**95% CI**	**Slope [3]**	**95% CI**	**Slope [3]**	**95% CI**
	0.26	0.08 - 0.44	0.11	0.03 - 0.19	0.16	0.06 - 0.26
	P - Value [4]		**P - Value [4]**		**P - Value [4]**	
	0.0185		0.0207		0.0101	

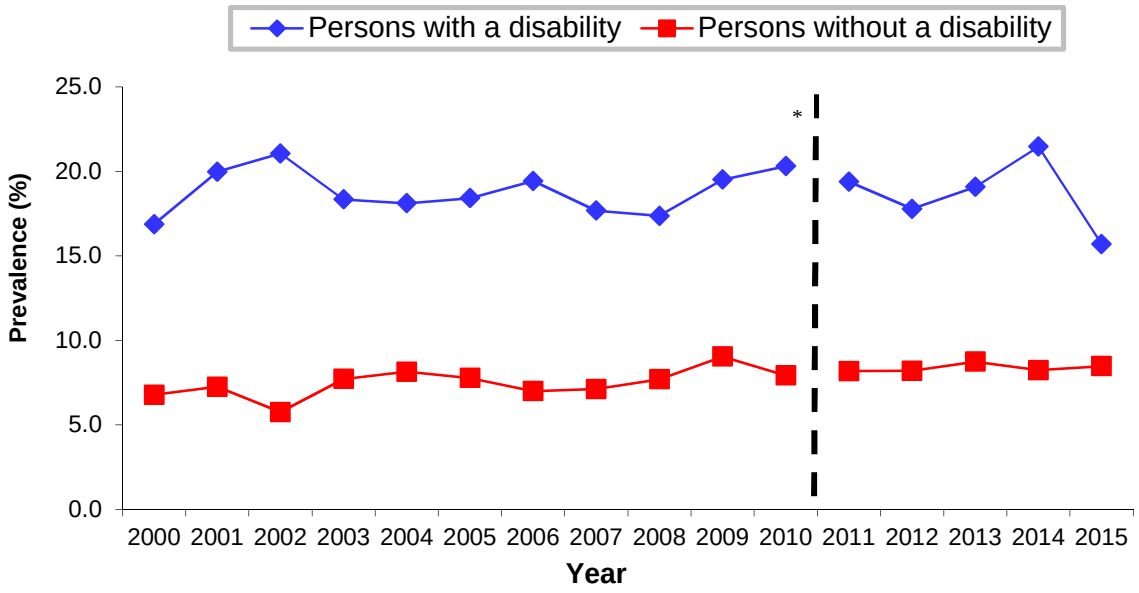
1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for though year 2000 to year 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, current asthma prevalence in Massachusetts was 13.5% among adults who were current smokers, 10.4% among former smokers, and 10.0% among never-smokers.
- In each year, from 2000 through 2015, current asthma prevalence in Massachusetts tended to be higher, although not always significantly higher, among current smokers compared to the other groups.
- From 2000 through 2010, current asthma prevalence among adults in Massachusetts who current smoked increased by 17.4%, an average of 0.26% each year.

Figure 1.11 Prevalence of Current Asthma among Massachusetts Adults by Disability Status, 2000-2015



Year	Person with disability*		Person without disability	
	% [1]	95% CI [2]	% [1]	95% CI [2]
2000	16.9	13.9 - 19.8	6.8	5.8 - 7.7
2001	20.0	16.9 - 23.0	7.3	6.3 - 8.2
2002	21.1	16.6 - 25.5	5.8	4.7 - 6.8
2003	18.3	15.2 - 21.5	7.7	6.6 - 8.8
2004	18.1	15.1 - 21.2	8.1	7.0 - 9.3
2005	18.4	13.8 - 23.0	7.8	6.4 - 9.2
2006	19.4	16.2 - 22.7	7.0	5.8 - 8.1
2007	17. 7	14.4 - 21.0	7.1	6.0 - 8.3
2008	17.4	15.7 - 19.1	7.7	6.9 - 8.5
2009	19.5	15.0 - 24.1	9.0	7.1 -11.0
2010	20.3	18.1 - 22.5	7.9	7.1 - 8.7
* 2011	19.4	17.3 - 21.5	8.2	7.3 - 9.1
2012	17.8	15.7 - 19.9	8.2	7.4 - 9.0
2013	19.1	17.0 – 21.0	8.7	7.8 - 9.7
2014	21.5	19.5 - 23.4	8.2	7.4 - 9.1
2015	15.7	13.7 - 17.7	8.5	7.5 - 9.4
Trend Analysis (2000-2010)	**Slope[3]** 0.05	**95% CI** -0.02 - 0.31	**Slope[3]** 0.12	**95% CI** 0.01 - 0.23
	P - Value[4] 0.6948		**P - Value[4]** 0.0580	

1. Percent is weighted to population characteristics.
2. 95% Confidence interval.
3. Slope (slope of the best line of fit calculated using Joinpoint Software) = the average percentage point increase or decrease per year (e.g. a slope of 1.0 indicates that the prevalence increased on average one percentage point per year). The slope was calculated for though year 2000 to year 2010.
4. P-value $\leq$ 0.05 is considered statistically significant because it means that there is at most a 5% chance of observing a trend, given that, in reality, rates are stable.

*Note: ---- Indicates the data after 2011 had a new weighting method.

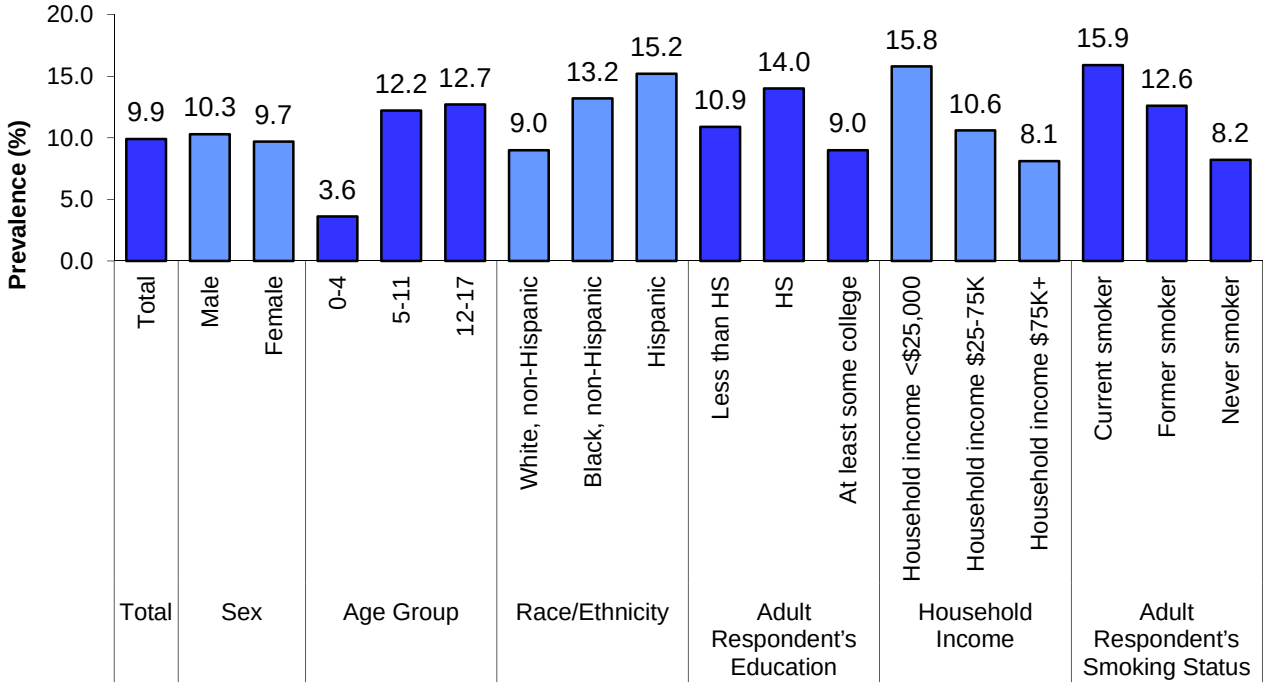
* See definition of disability in Definition section.

Data Source: 2000-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health.

- In 2015, the prevalence of current asthma was 15.7% among Massachusetts adults with a disability, and 8.5% among Massachusetts adults without a disability.
- In each year, from 2000 through 2015, the prevalence of current asthma was consistently higher among adults with a disability than those without a disability.
- Overall, the prevalence of current asthma did not increase among either adults with a disability or adults without a disability from 2000 through 2010.

4. Asthma Prevalence among Children

Figure 2.1 Prevalence of Current Asthma among Massachusetts Children by Demographic and Socioeconomic Factors, 2013-2015



Demographic and Socieconomic Factors among Children Who Had Current Asthma 2013-2015

Data Source: 2013-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health

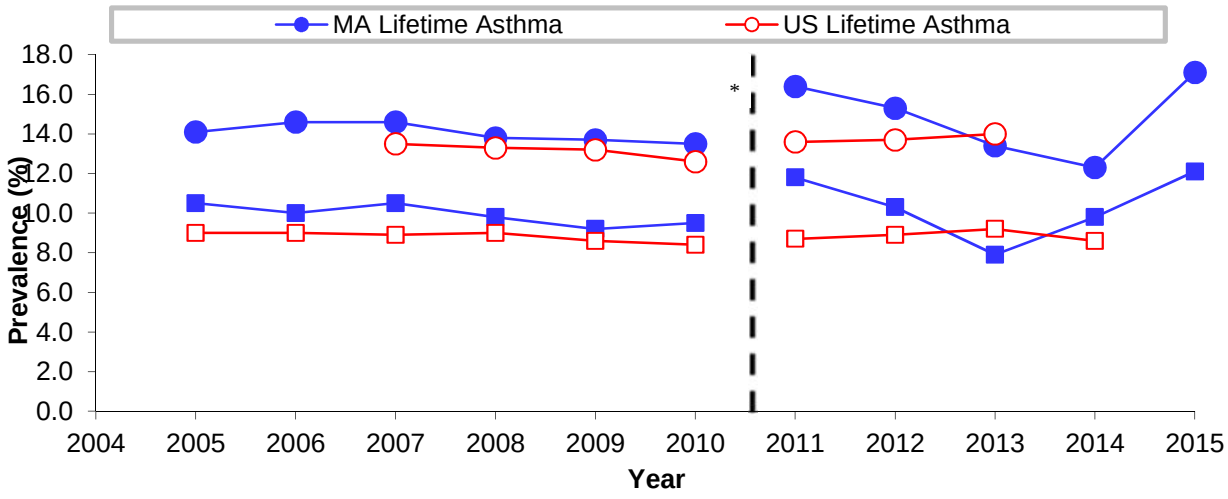
Table 2.1 Prevalence of Current Asthma among Children by Demographic and Socioeconomic Factors, 2013- 2015

Demographic and Socioeconomic Factors		N[1]	%[2]	95% CI[3]
Total	Total	2,061	9.9	7.9 - 11.9
Sex	Male	2,017	10.3	7.5 - 13.0
	Female		9.7	6.7 - 12.6
Age Group (Years)	0-4	1,721	3.6	1.2 - 8.1
	5-11		12.2	8.0 - 16.4
	12-17		12.7	9.2 - 16.1
Race/Ethnicity	White, non-Hispanic	2,040	9.0	7.0 - 11.0
	Black, non-Hispanic		13.2	4.3 - 22.1
	Hispanic		15.2	6.7 - 23.6
Adult Respondent's Education	Less than high school	2,057	10.9	7.0 - 21.0
	High school		14.0	6.9 - 11.0
	At least some college		9.0	7.9 - 23.7
Household Income	Household income <$25,000	1,839	15.8	7.9 - 23.7
	Household income $25-75,000		10.6	6.3 - 14.8
	Household income ≥ $75,000+		8.1	5.8 - 10.3
Adult Respondent's Smoking Status	Current smoker	2,049	15.9	7.9 - 23.9
	Former smoker		12.6	8.0 - 17.2
	Never smoker		8.2	6.0 - 10.3

1. N is the number of respondents who answered the corresponding question(s).
2. Percent is weighted to population characteristics.
3. 95% Confidence interval.
Data Source: 2013-2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health

- The three-year average annual prevalence of current asthma among children in Massachusetts was 9.9%. High asthma prevalence among children is associated with:
  - Being between the ages of 12 and 17 (12.7%)
  - Having a household income of less than $25,000 per year (15.8%)

Figure 2.2 United States and Massachusetts Prevalence Trends of Lifetime and Current Asthma among Children, 2005-2015



	Lifetime Asthma					Current Asthma				
	Massachusetts				US	Massachusetts				US
Year	N[1]	%[2]	95% CI[3]	Estimated Prevalence Number[4]	%[2]	N[1]	%[2]	95% CI[3]	Estimated Prevalence Number[4]	%[2]
2005	1,843	14.1	12.1 - 16.2	27,478	12.5	1,837	10.5	8.6 - 12.3	20,274	9.0
2006	1,924	14.6	12.4 - 16.9	22,437	12.8	1,916	10.0	8.1 - 11.9	15,248	9.0
2007	1,186	14.6	12.2 - 17.4	209,137	13.5	1,181	10.5	8.5 - 12.9	149,038	8.9
2008	1,901	13.8	11.7 - 16.1	194,931	13.3	1,843	9.8	8.0 - 12.0	136,267	9.0
2009	1,424	13.7	11.5 - 16.3	192,204	13.2	1,419	9.2	7.4 - 11.5	128,894	8.6
2010	1,407	13.5	11.1 - 16.2	188,205	12.6	1,403	9.5	7.6 - 11.9	132,887	8.4
* 2011	1,462	16.4	13.4 - 19.4	228,674	13.6	1,457	11.8	9.1 - 14.6	164,776	8.7
2012	1,378	15.3	12.5 - 18.1	213,733	13.7	1,369	10.3	7.9 - 12.8	143,503	8.9
2013	816	13.4	9.8 - 17.0	181,337	14.0	811	7.9	5.1 - 10.7	106,723	9.2
2014	712	12.3	8.3 - 16.0	163,196		709	9.8	6.0 - 13.5	129,368	8.6
2015	545	17.1	12.9 - 21.0	221,872		541	12.1	8.4 - 15.7	155,810	

1. N is the number of respondents who answered the corresponding question(s).
2. Percent is weighted to population characteristics.
3. 95% Confidence interval.
4. Prevalence numbers are population estimates.

*Note: ---- Indicates the data after 2011 had a new weighting method.

Data Source: 2005- 2015 MA Behavioral Risk Factor Surveillance System, Massachusetts Department of Public Health; U.S. Data: 2000-2014 US Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention. States include District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands in applicable years. Total includes data from 36 states based on cellphone and landline data combined; excludes the territory, Puerto Rico, in 2014.

- In 2012, prevalence of lifetime (15.3%) and current (10.3%) asthma among children was higher in Massachusetts than in the US (13.7% and 8.9%, respectively); however, it could not be determined if this difference was statistically significant.