Chapter 224 Follow-Up Report (2012-2016)

OFFICE OF THE MASSACHUSETTS STATE AUDITOR | SUZANNE M. BUMP | JULY 2018

This report is presented as a follow-up to the *Evaluation of the 2012 Health Care Cost Containment Law In Massachusetts*, published by the Massachusetts Office of the State Auditor in June 2017 and available at:

http://www.mass.gov/auditor/docs/chapter-224/osa-chapter-224-report-june-2017.pdf

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Executive Summary

Public health measures based on self-reported survey data (the Behavioral Risk Factor Surveillance System, or BRFSS data from the Department of Public Health) primarily show a lack of progress in approximately 60% of measures; about 26% of the measures show lost ground and about 13% indicated progress. A widespread reduction of current smoking among adults stood out as a bright spot.

Although there are some gains, disparities by income and by racial/ethnic groups persist, with African-Americans and Latinos continuing to suffer a large gap in selective measures.

This report includes ten measures based on claims data, which predominantly show modest progress among most age-based groups.

In addition, the gap in access and quality of health measures between commercially-covered and MassHealth-covered individuals has not changed between 2012 and 2016.

Since these measures represent approximately 38% of the data presented in three chapters in the 2017 report, a more comprehensive assessment of access, quality, and population health may show a different combination between improving, worsening, and no change.

Key Findings

While it is good to examine the results for individual measures, the overall take away from the self-reported measures (based on BRFSS) is that there were few changes, and when changes occurred, there were twice as many more negative than positive.

Three bright spots were found: increased pneumonia vaccinations among older adults, a reduction of current asthma among male adults, and a wide-spread reduction in current smoking among adults.

Disparities among racial/ethnic groups and income groups persist, and at worrisome levels in some instances.

The administrative data (claims) presents a picture of overall progress for most groups, but concerning disparities persist between the commercially-covered and MassHealth-covered populations.

Introduction

The purpose of this report is to add an additional data point to the 2017 OSA Chapter 224 report* to better understand the trends. The work represents a longitudinal study exploring changes from 2012 to 2016 for a total of 51 measures related to access and quality of care, prevention, and health outcomes for racial/ethnic groups, using BRFSS data from DPH as well as APCD6 and MassHealth data.

Many data previously used in the 2017 report were not available for this report and those that were available were delayed in delivery.

In working on the 2018 report, we saw a reduction in the data reported to CHIA for APCD6, likely due to the 2016 Supreme Court decision that ruled that states cannot compel employer self-insured health plans or their third-party administrators (TPAs) to provide claims data for APCDs. An employer's self-insured health plan may voluntarily submit data, but they must give their TPA explicit permission to do so.

In Massachusetts, this change resulted in decreases in reported claims from these plans, with the state's top three TPAs experiencing drops of 38%, 18% and 13% in authorized self-insured claims data submissions. This difference in claims created concerns of systematic variation, which would then introduce greater bias into findings for this report. This issue was addressed by using a different statistical procedure – Relative Risk instead of Odds Ratio.

This report presents results for a total 51 of the original 136 variables from three of five original chapters in the 2017 report.

*Reynoso-Vallejo, H., Lomax, P., Porche, M., Louie-Gao, Q. et al. (2017). Evaluation of the 2012 Health Care Cost Containment Law in Massachusetts. Office of the State Auditor. Page 75. Available at http://www.mass.gov/auditor/docs/chapter-224/osa-chapter-224-report-june-2017.pdf.

Research Design

This report has a longitudinal design covering three areas:

- Access and Quality of Care
- Reducing Preventable Health Conditions
- Racial/Ethnic Disparities in Health Outcomes

Statistical Analyses conducted for this work include:

- The logistic regression model to estimate the probability of the dichotomous outcome variables
- The method of generalized estimating equations to analyze longitudinal data, which accounts for the correlation inherent in using multiple observations for each individual
- For group comparisons, the Chow test was used to test whether the coefficients estimated for one group are equal to those for another group

Data issues:

- APCD6 data reduction as noted in the Introduction
- DPH mortality and cancer registry were not available for 2016

Methodology

For each DPH BRFSS measure, OSA conducted three different analyses:

1. A Trend Test across the years for each category (gender, race/ethnicity, etc.) to assess if there was a significant increase or decrease across the year, e.g. from 2011 to 2016;

2. A categorical year Odds Ratio analysis for each category to quantify the significant difference between the specific year and the reference year of 2012; and

3. A Multivariate Regression analysis for differences between groups, adjusting for year, sex, and age as feasible and/or needed.

Not all of the analysis conducted is being presented in this report, which highlights only the most relevant results. For APCD and MassHealth data, Generalized Estimation Equations were used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent and observations within subjects are assumed to be correlated.

Relative Risk and Odds Ratio procedures were conducted to analyze APCD6 and MassHealth.

Considering the data reduction in APCD6, all 2016 APCD-based findings should be cautiously interpreted.

1a. Access and Quality of Care (DPH Data)

This section presents five measures corresponding to the 2017 report (sub-chapters 2.2 and 2.3). A longitudinal statistical analyses of quality measures, constructed from National Committee for Quality Assurance (NCQA) guidelines, was conducted.

These measures include obesity rates, pneumococcal vaccine, influenza vaccination, usual source of care, and unmet need for care.

Unless otherwise noted, all charts based on BRFSS data show only the year-to-year data for the chosen groups. The significance of overall trends for each group are not shown in the tables, but may be mentioned in the text if it was found to be statistically significant.

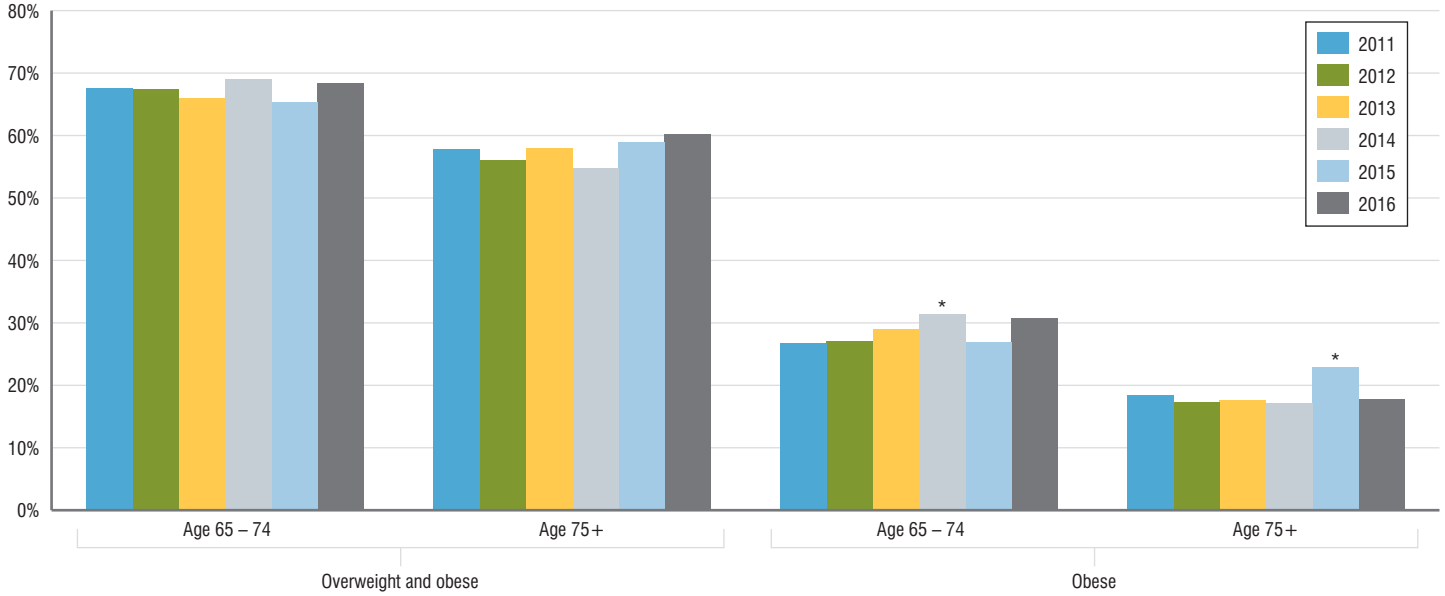
OSA conducted additional analyses, not shown in this report, that controlled for gender, age, and year, as appropriate. These additional analyses were tested for between-group differences. Some of these additional findings are shared in the text and are indicated by the notation of *(data not shown)*.

The odds of overweight (having a body mass index or BMI greater than 25) or obesity (BMI greater than 30) did not change significantly in 2016 as compared to 2012 for adults aged 65 and older. The overall trend, 2011-2016, did not change significantly for overweight or obesity for either age group.

In 2016, obesity rates were 30.7% among those aged 65-74 and 17.7% among those aged 75 and older.

After controlling for year, we found adults aged 65-74 were significantly more likely to be overweight and more likely to be obese than those aged 75 and older (data not shown).

Table 1. Overweight and obesity, adults aged 65 and over



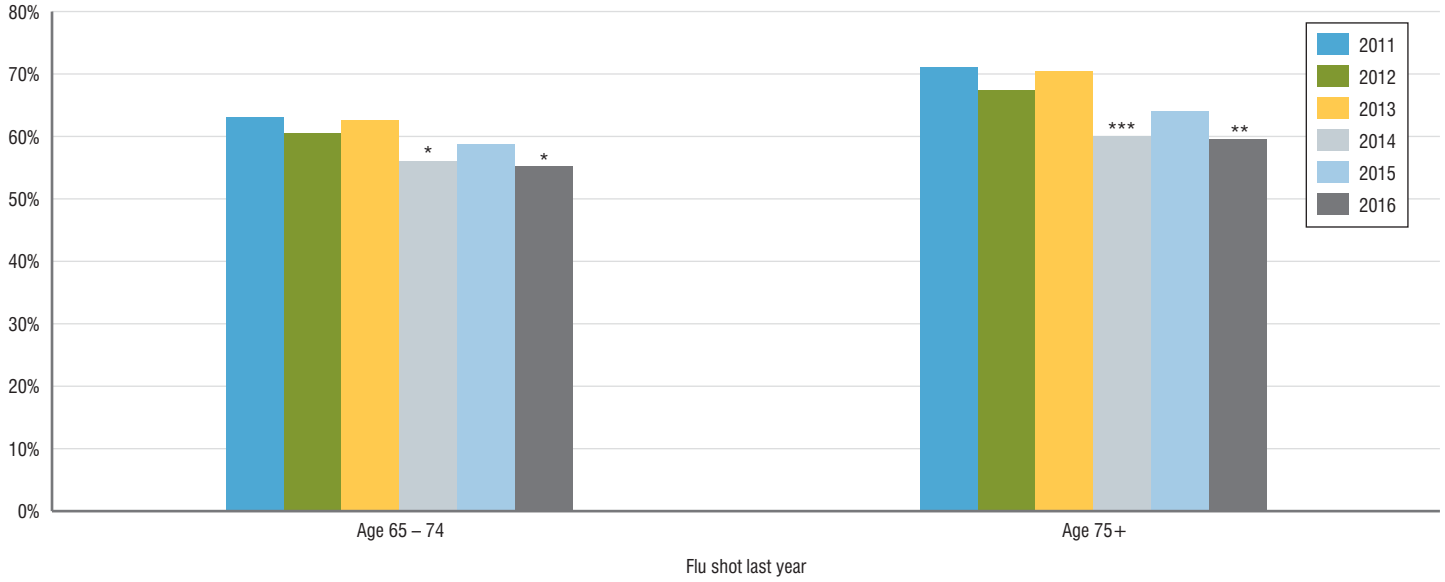
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Compared to 2012, both age groups (65 to 74 and 75 and older) continued to experience a decrease in receiving flu shots. In 2012, the 65-74 age group had a 60.5% rate, whereas in 2016, only 55.2% received a flu shot, a roughly five-percentage point decrease.

Furthermore, there was a significant decrease in the overall trend, 2011 to 2016, among both age cohorts (data not shown).

After adjusting for year, those aged 75 and over were significantly more likely to receive the flu shot than those aged 65-74 (data not shown).

Table 2. Received flu shot in the past year, adults aged 65 and over

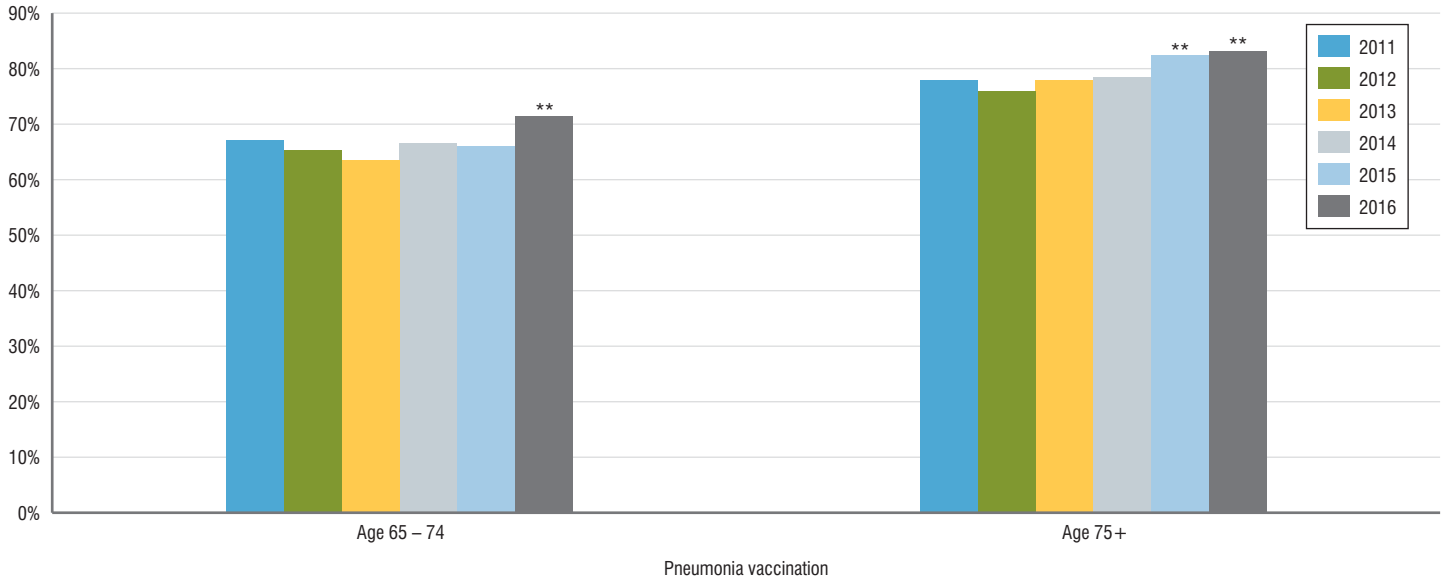


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

When compared to 2012, both age cohorts had higher odds of vaccination in 2016.

For the overall trend (2011 to 2016), both cohorts had a significant increase in receiving the pneumonia vaccine (data not shown), marking progress for those aged 65-74 since the OSA 2017 Chapter 224 report

Table 3. Received pneumonia vaccination in lifetime, adults aged 65 and over



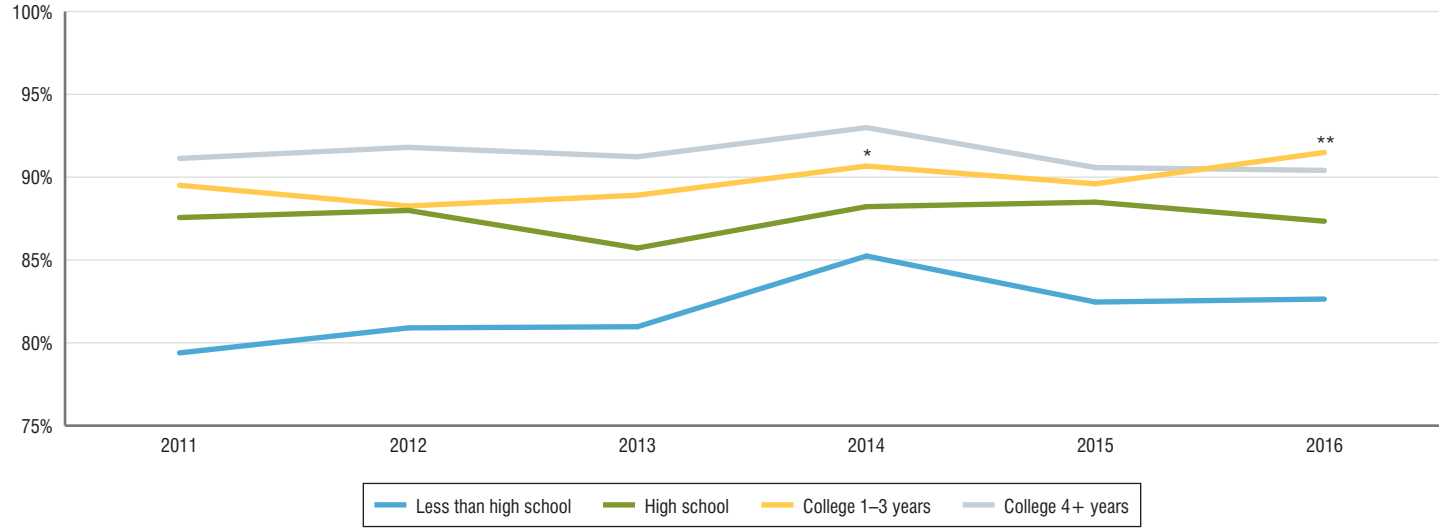
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Of the four groups disaggregated by educational attainment, only those with 1-3 years of college had a significant increase in odds of having a personal health care provider, when comparing 2012 to 2016.

This same group also had a significant increase in the overall trend, 2011-2016 (data not shown).

After controlling for year, the odds of having a personal care provider significantly increased with each and every educational cohort (data not shown).

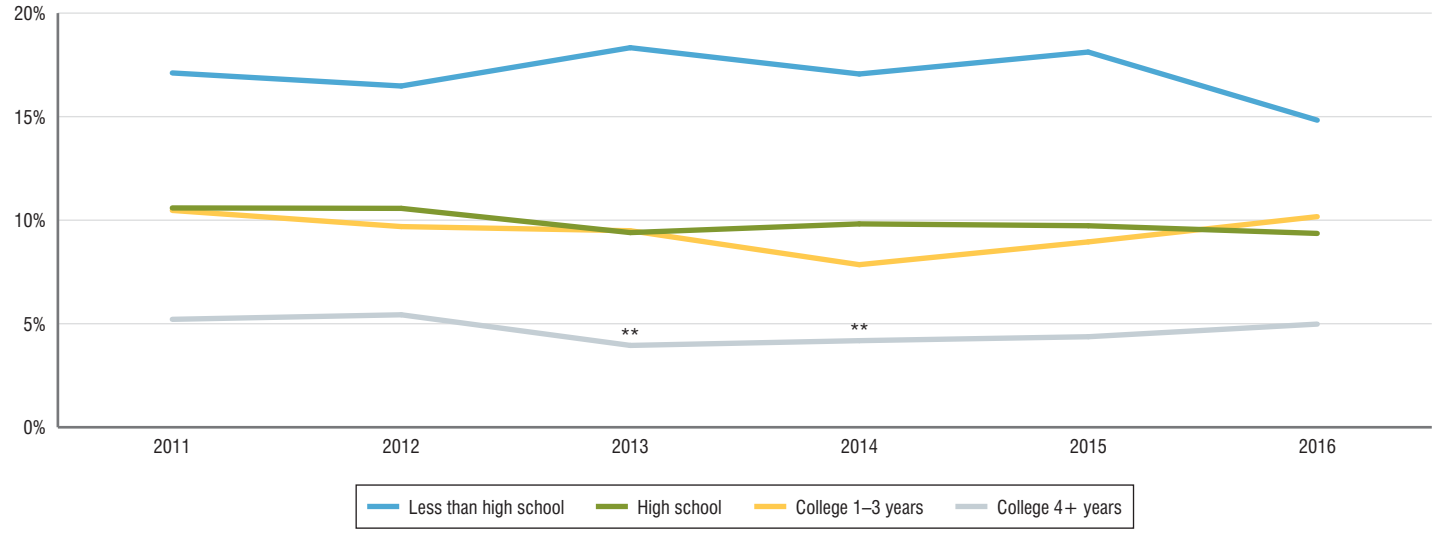
Table 4. Had a personal health care provider, adults by education level



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

After controlling for year, the odds of not seeing a doctor due to cost significantly lowered with each and every educational level, so that those with four or more years of college had 76% lower odds than those without a high school degree to skip care due to cost (data not shown).

Table 5. Could not see a doctor due to cost, adults by education level



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

1b. Reducing Preventable Health Conditions (DPH Data)

This section presents 20 variables corresponding to the 2017 report (sub-chapter 5.1) and explores preventable health conditions using a longitudinal statistical framework of measures related to chronic disease and prevention. Topics include the prevalence of infectious disease and chronic conditions, key risk factors, and screening for several cancers.

Unless otherwise noted, all charts based on BRFSS data show only the year-to-year data for the chosen groups. The significance of overall trends for each group are not shown in the tables, but may be mentioned in the text if it was found to be statistically significant.

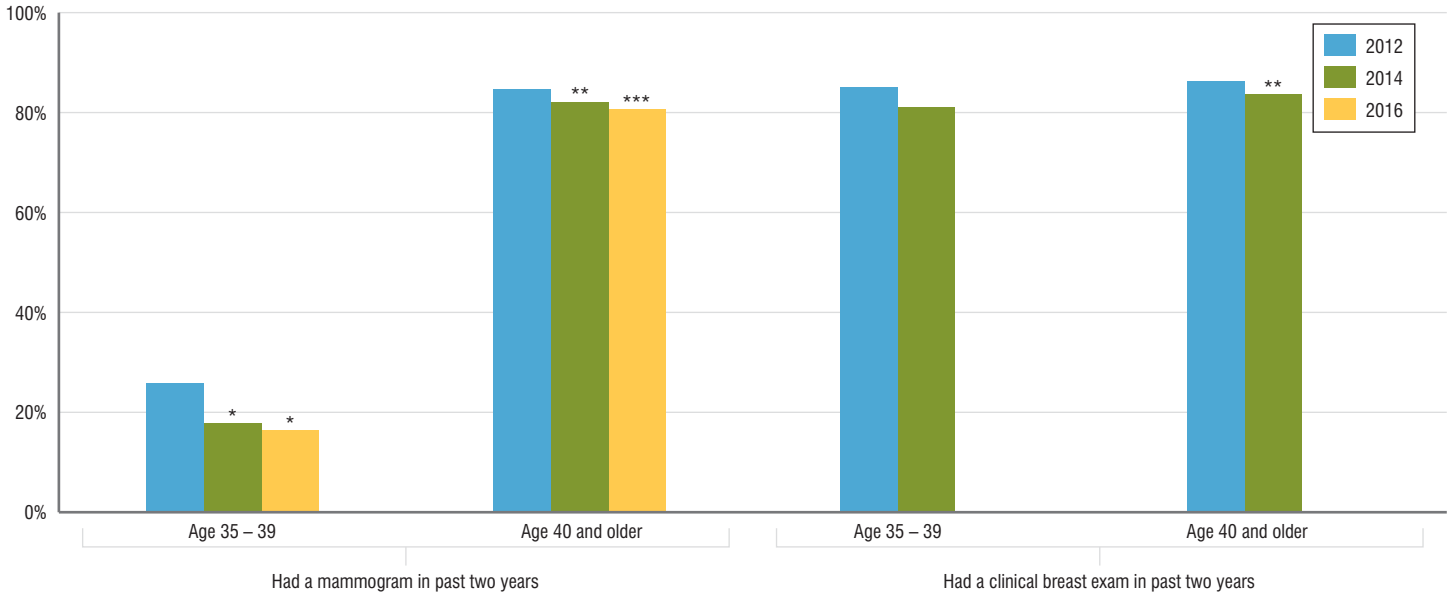
OSA conducted additional analyses, not shown in this report, that controlled for gender, age, and year, as appropriate. These additional analyses were tested for between-group differences. Some of these additional findings are shared in the text and are indicated by the notation of *(data not shown)*.

Women (both groups aged 35-39 and aged 40+) had significantly lower odds of having a mammogram in the past two years in 2016 compared to 2012.

The overall trend, 2012-2016, showed a significant reduction among women in both age groups (data not shown).

Additionally, the odds of women aged 40 and older who had a clinical breast exam in 2014 was lower than in 2012.

Table 6. Breast cancer screening in the past two years, women aged 35 and over

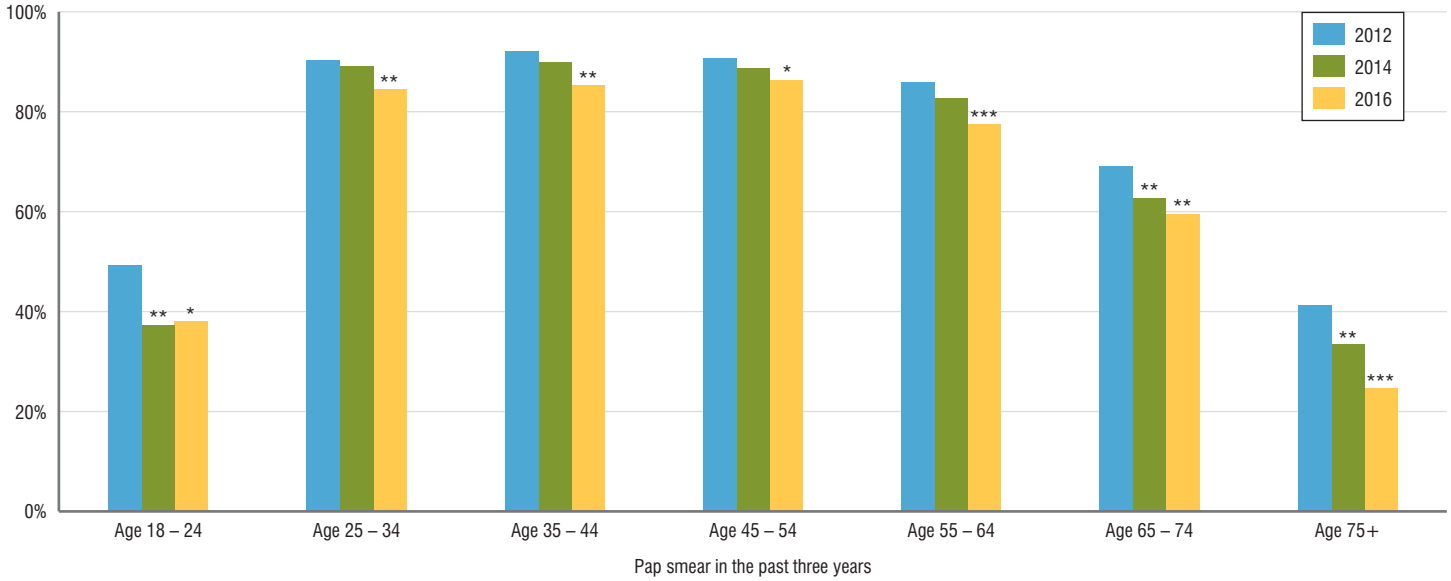


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

The odds of women having a pap smear were significantly lower in 2016 when compared to 2012 for all age groups.

Furthermore, the overall trend (2012-2016) of having a pap smear in the past three years significantly declined for all age categories (data not shown).

Table 7. Pap smear in the past three years, women aged 18 and over

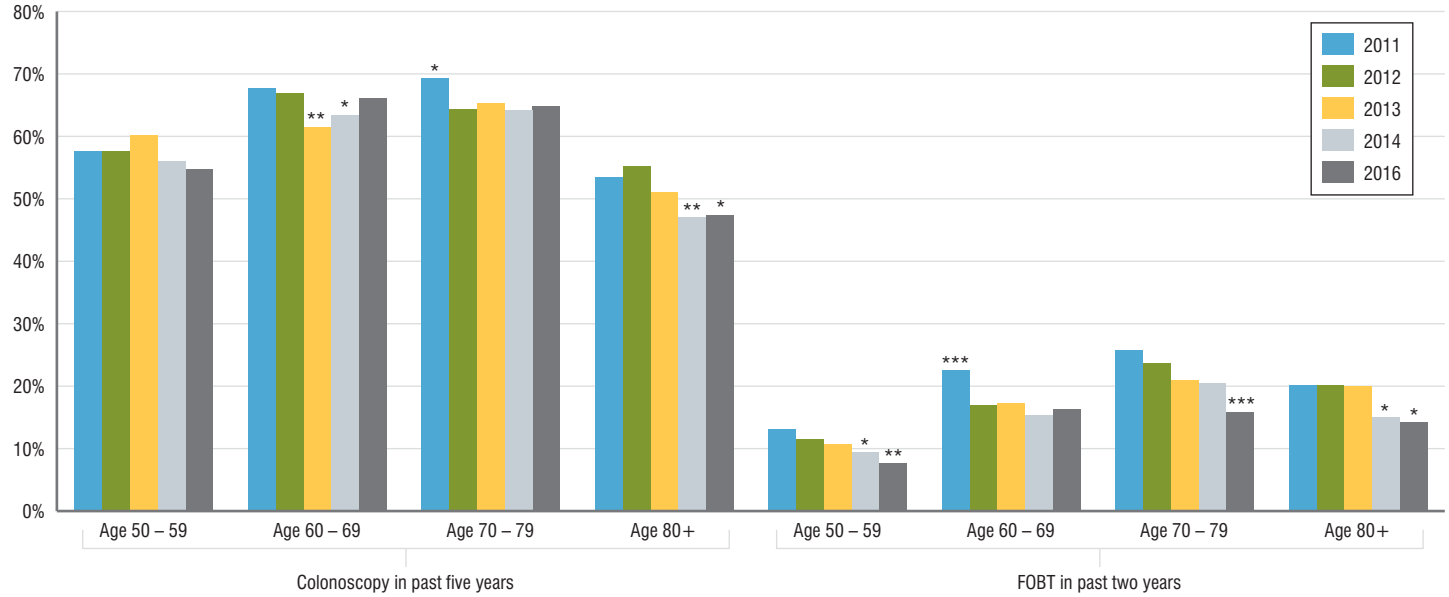


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

There was a significant decrease in the odds of having a fecal occult blood test (FOBT) in the past two years among all age groups except those aged 60-69 years (2016 compared with 2012).

We found no significant decrease in 2016 (compared to 2012) in persons aged 50-79 who received a colonoscopy in the past five years.

Table 8. Colonoscopy in past five years and fecal occults blood test in past two years, adults aged 50 and over

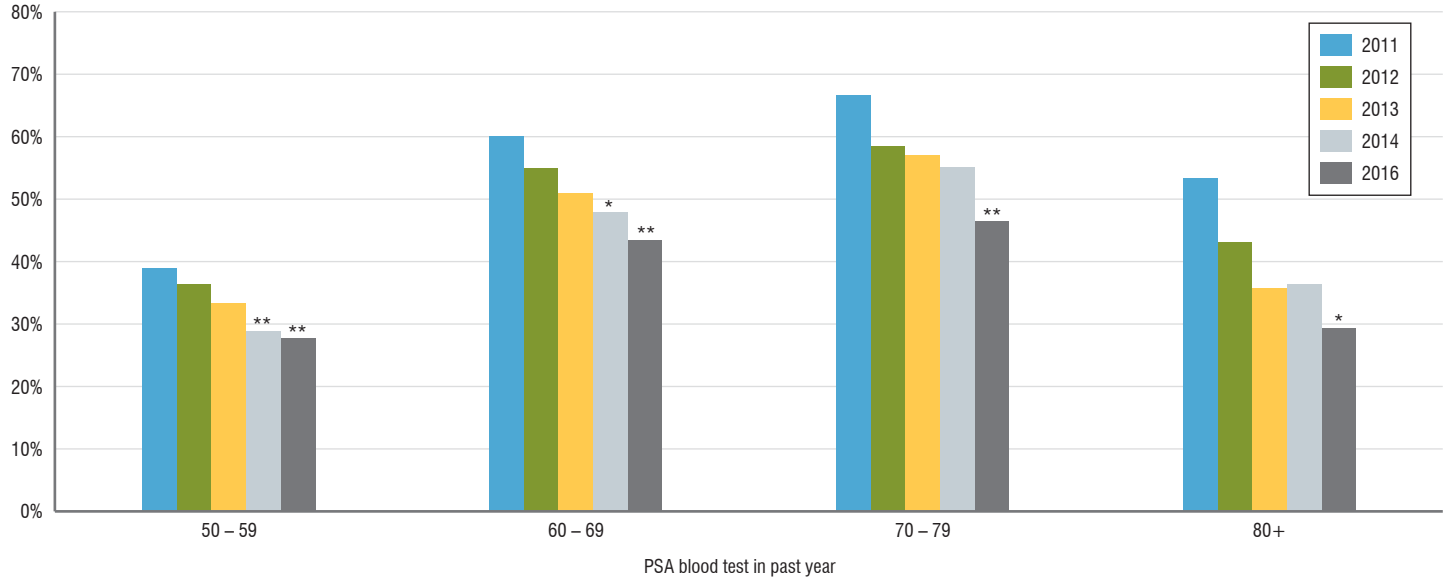


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

There was a decrease in the odds of men aged 50 and older receiving a prostate-specific antigen (PSA) blood test in 2016.

All four age groups also had a decrease in the overall trend, 2011 to 2016 (data not shown).

Table 9. Prostate-specific antigen (PSA) blood test in the past year, men aged 50 and over

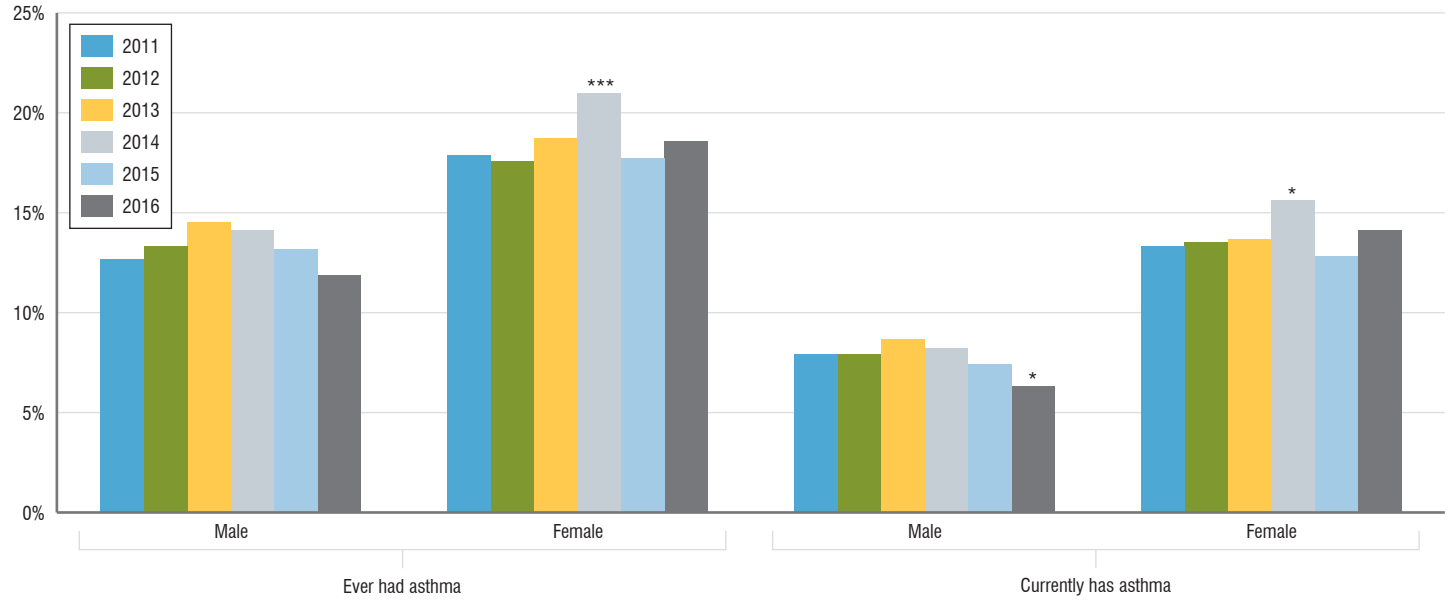


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Overall trends in asthma rates generally held steady, 2011-2016, except for a significant decrease among males reporting current asthma.

After controlling for year and age, females in Massachusetts had 92% higher odds of current asthma than males (data not shown).

Table 10. Asthma prevalence, adults

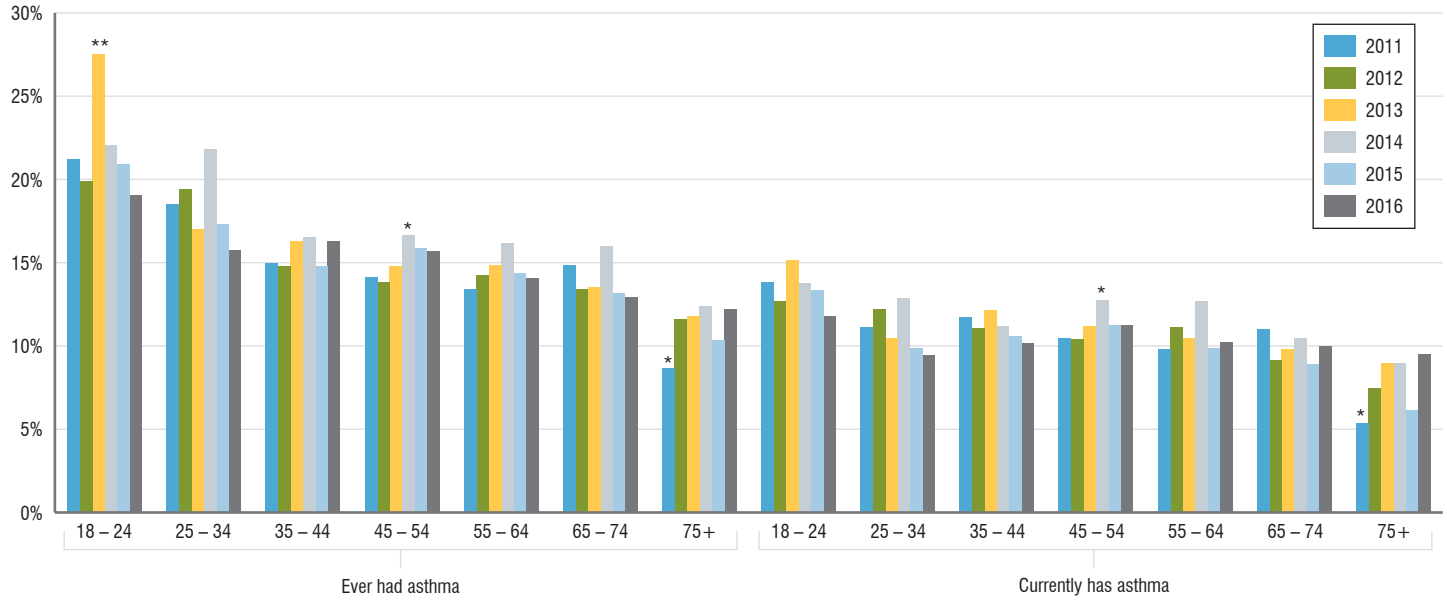


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

A steady rate was observed for all age groups, as there were no significant changes in overall trends, 2011-2016, nor in 2016 odds compared to 2012 odds.

After controlling for year and gender, the odds of asthma decreased as age increased (data not shown).

Table 11. Asthma prevalence by age, adults



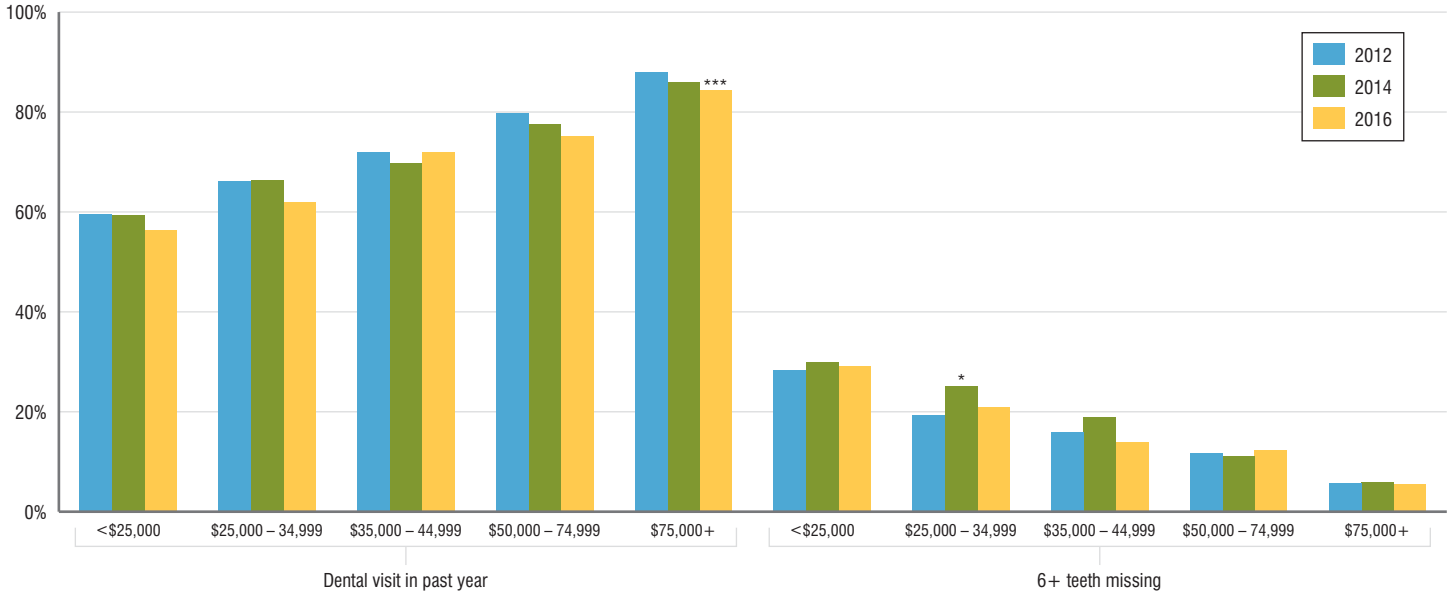
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Only among those in households earning more than $75,000 per year was there a significant decrease in dental visits in 2016, as compared to 2012.

The odds of missing six or more teeth did not change among any of the income groups.

After controlling for year, those in households with incomes below $25,000 had 77% lower odds of a dental visit in the past year and 221% higher odds of missing six or more teeth than those with household incomes above $75,000 (data not shown).

Table 12. Oral health indicators by household income, adults aged 50 and over



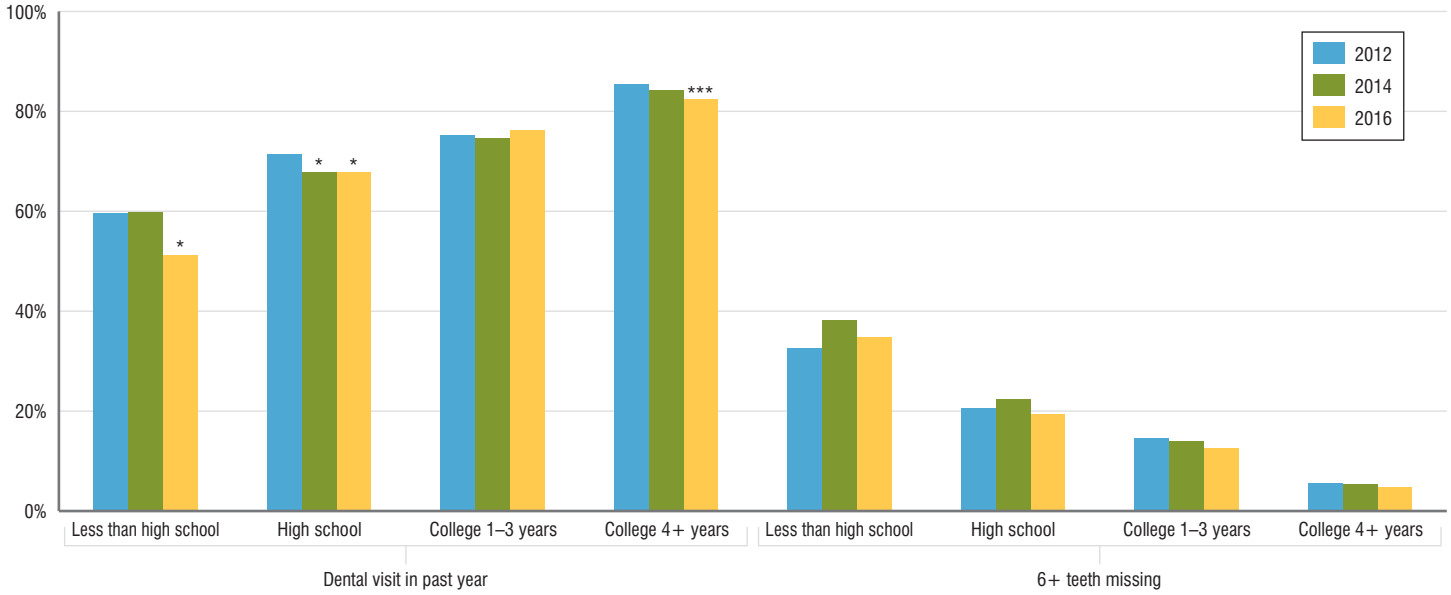
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Adults aged 50 and older in three of four education categories saw a significant decrease in odds of having a dental visit in the past year, 2016 compared to 2012, and in the overall trend (2011-2016).

The odds of missing six or more teeth did not change significantly in 2016, compared to 2012, among any group.

After controlling for year, those with four or more years of college had 398% higher odds of a dental visit and 90% lower odds of missing six or more teeth than people with less than a high school degree (data not shown).

Table 13. Oral health indicators by education level, adults aged 50 and over

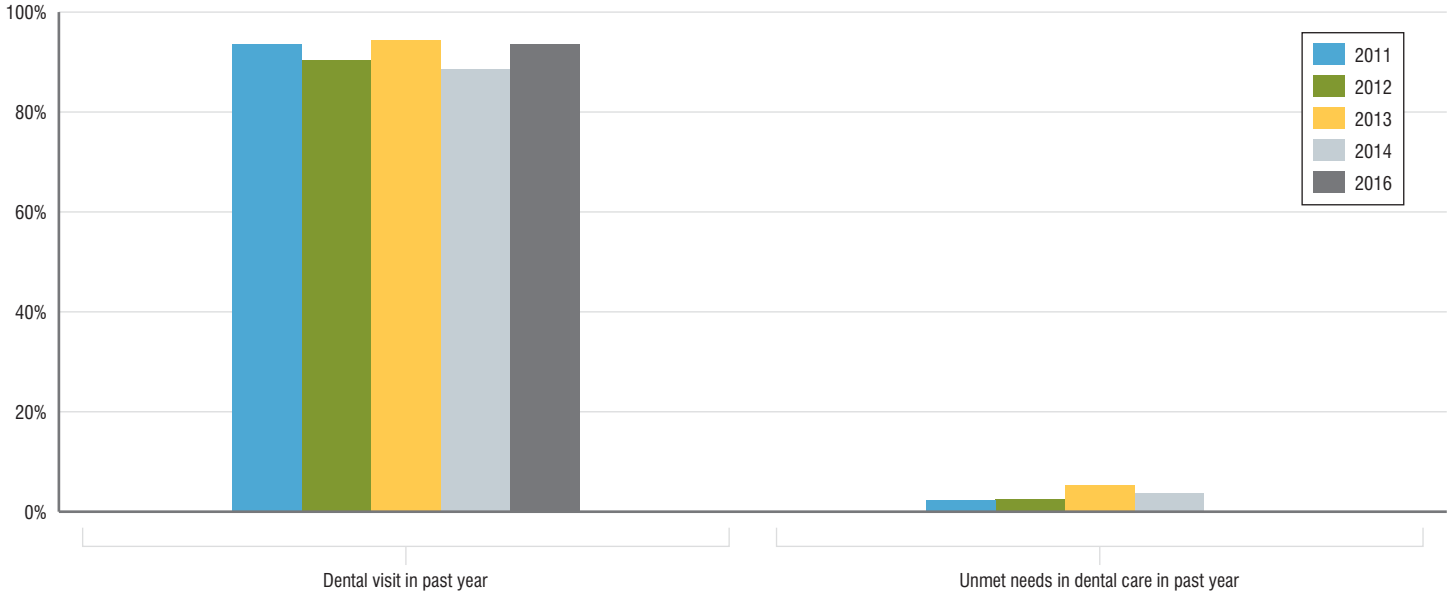


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Dental insurance coverage is near-universal for children because it was required by the Patient Protection and Affordable Care Act of 2010; thus, we saw continued high rates of a dental visit in the past year, i.e., 93.6% in 2016.

There was no significant change in the odds of a dental visit, 2016 compared to 2012.

Table 14. Access to oral health care, children



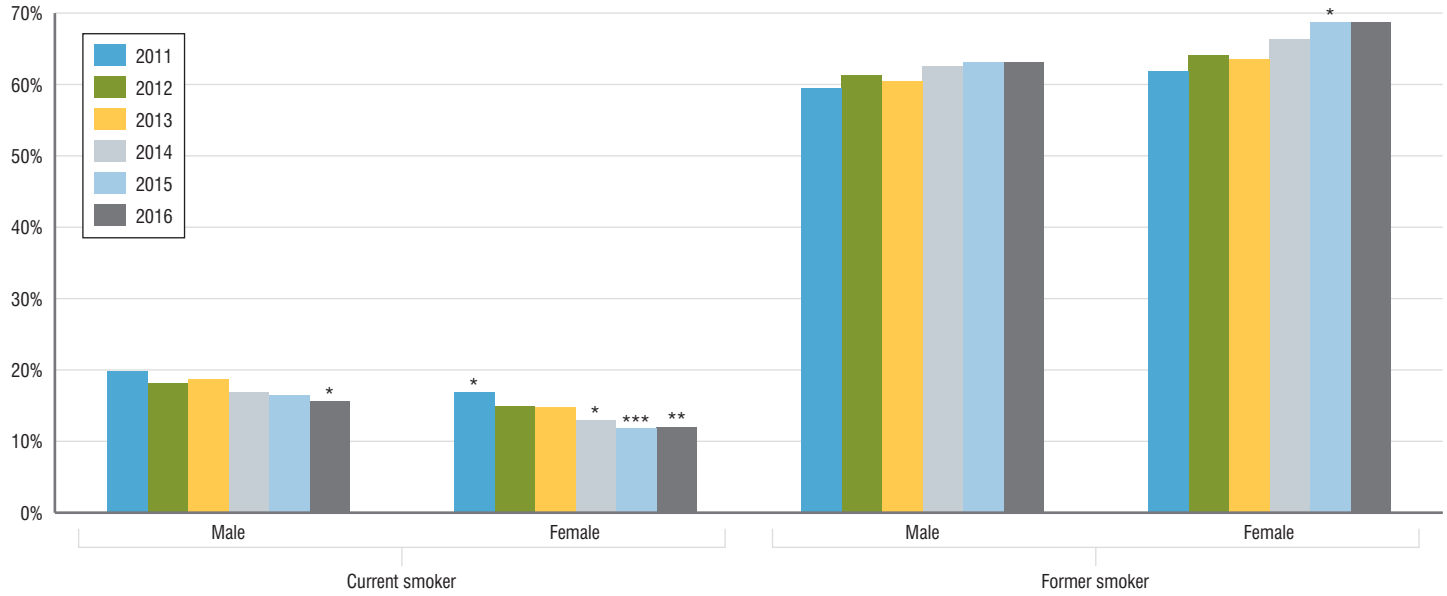
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Both males and females experienced a significant decrease in odds of current smoking in 2016 (compared to 2012). The overall trend tests (2011-2016) measured a significant decrease in current smoking and a significant increase in former smoking among both men and women (data not shown).

It is important to remember specific subgroups with financial, social, or mental struggles have higher rates of smoking and would benefit from tailored interventions.

After controlling for year and age, males were 33% more likely to report current smoking than females (data not shown).

Table 15. Current and former smoking rates, adults



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

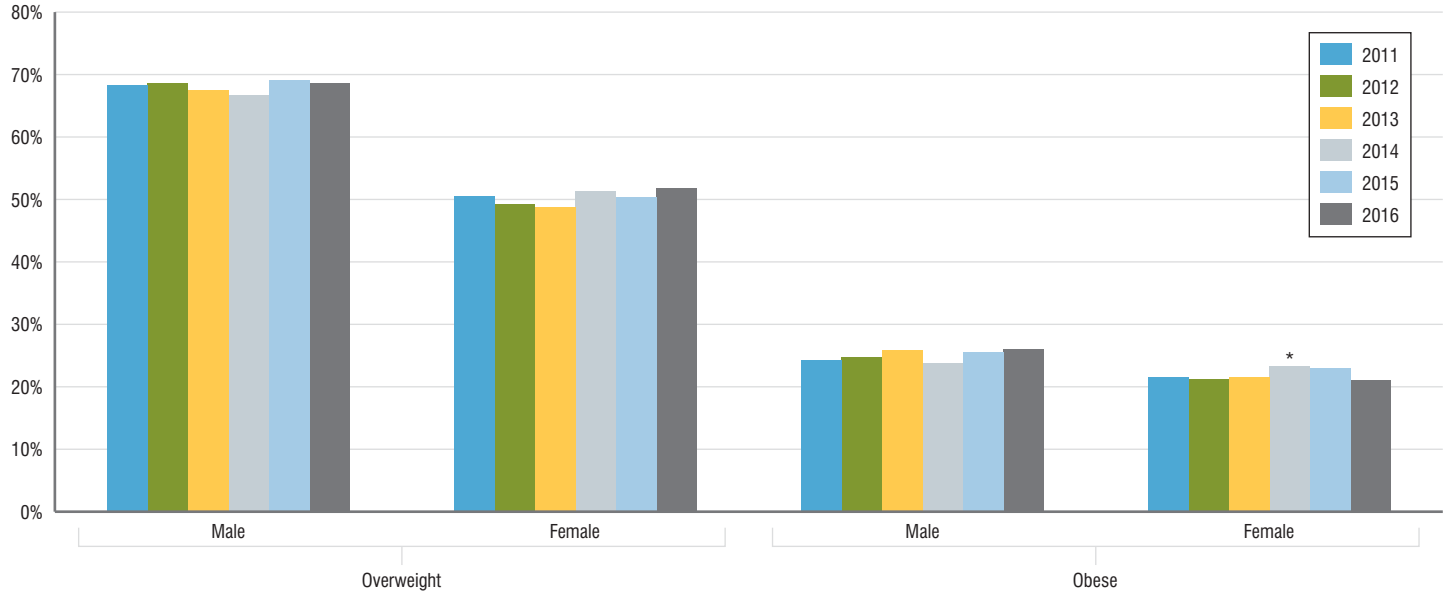
There were no significant changes in odds of overweight (having a body mass index or BMI greater than 25) or obesity (BMI greater than 30) among either males or females in 2016, compared with 2012. The overall trend (2011-2016) saw no significant changes.

These data suggest the increase in obesity among females reported in the OSA 2017 report on Chapter 224 has been reversed.*

After controlling for age and year, males had 111% higher odds of overweight and 19% higher odds of obesity than females (data not shown).

*OSA Report (ibidem).

Table 16. Overweight and obesity, adults



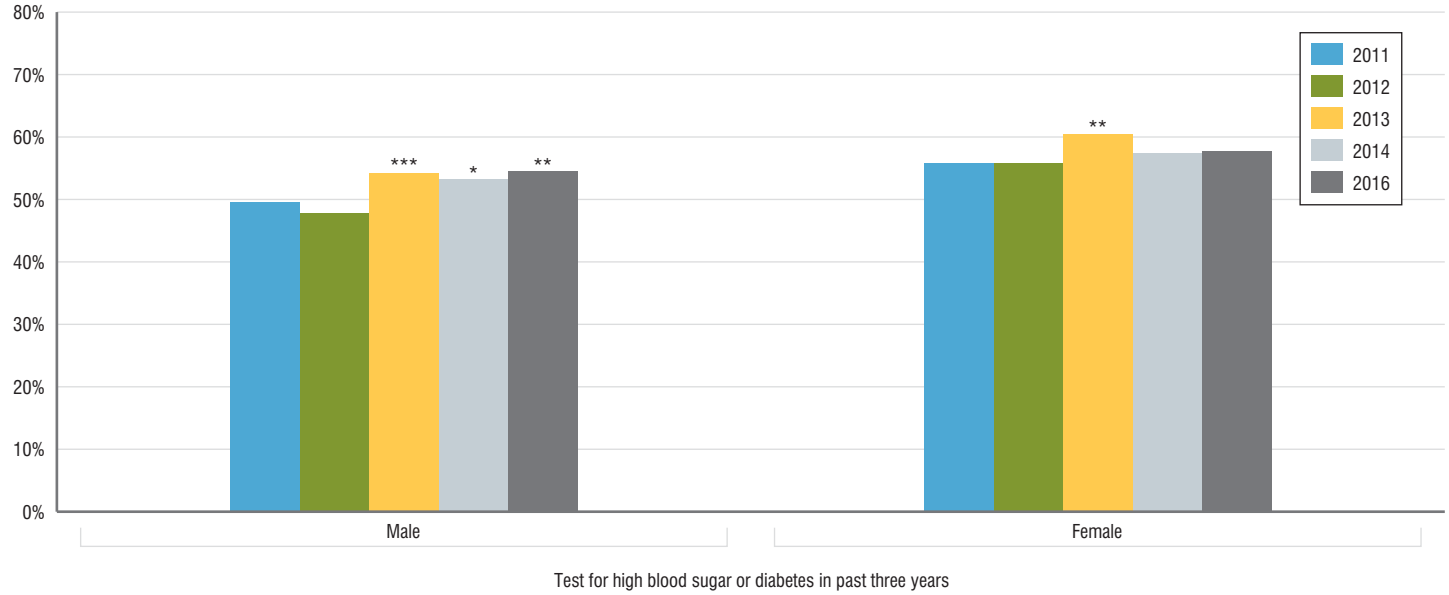
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Adult males had significantly higher odds of being tested for high blood sugar or diabetes in the past three years in 2016, compared to 2012.

Males had a significant increasing overall trend of testing, 2011-2016.

After controlling for age and year, males had significantly lower likelihood of being tested compared to females (data not shown).

Table 17. Tested for diabetes in past three years, adults



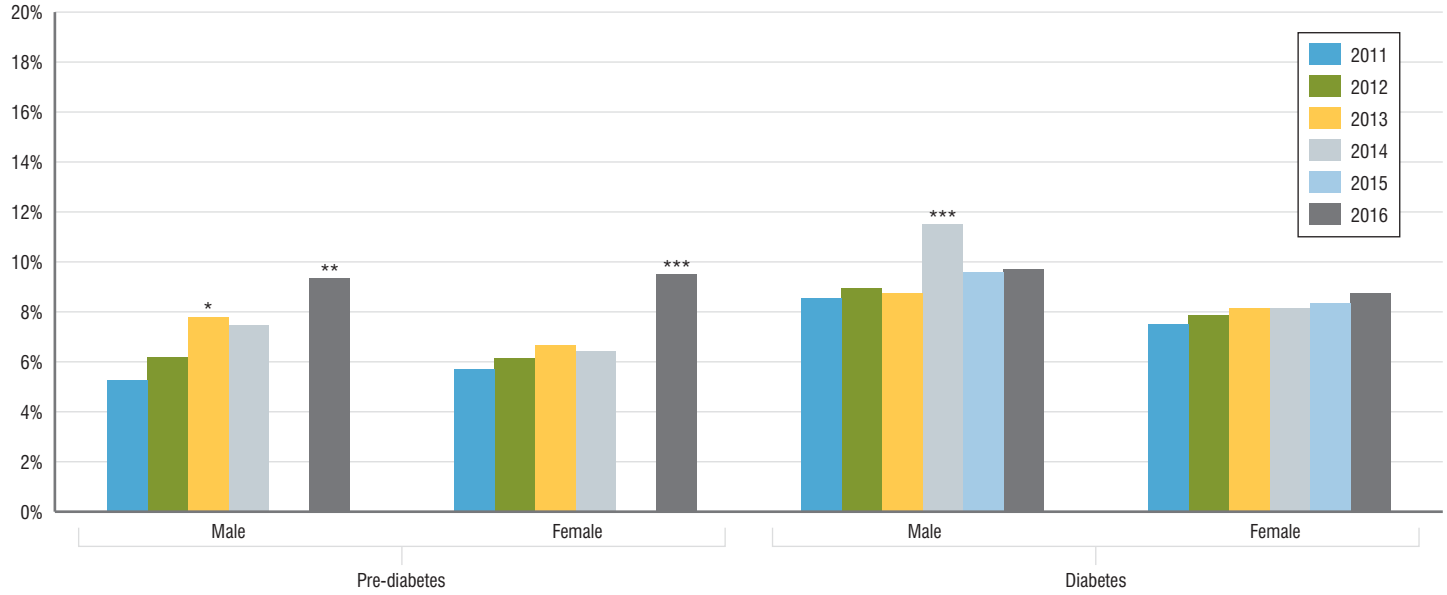
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

While the 2016 odds of pre-diabetes were significantly higher among men (57%) and women (61%) when compared to 2012, the diabetes odds were not significantly different.

The overall trend tests found a significant increase in pre-diabetes among men, pre-diabetes among women, and diabetes among men.

After controlling for age and year, diabetes was more prevalent among men than among women (data not shown).

Table 18. Diabetes prevalence, adults



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

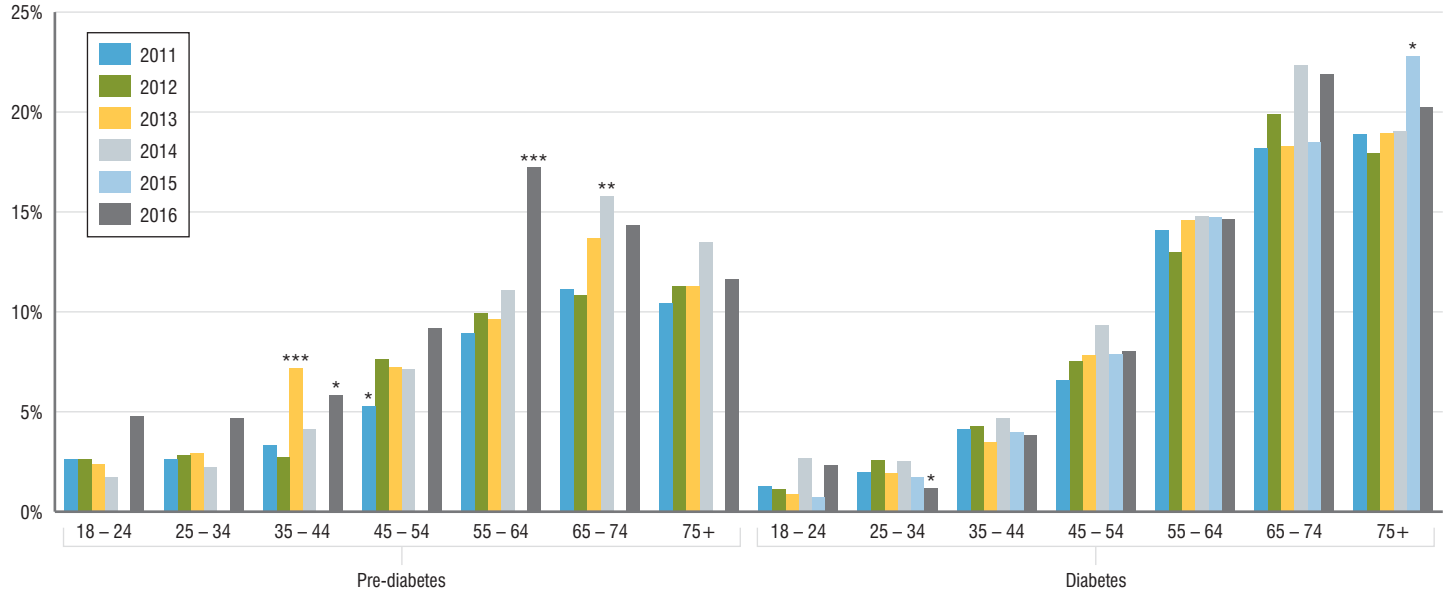
Increases in the 2016 odds of pre-diabetes were measured among those aged 35-44 (118%) and 55-64 (89%); the overall trend (2011-2016) was significant and increasing for the four age groups among those aged 35-74.

No age group saw a significant increase in odds of diabetes in 2016, compared to 2012, marking an improvement for those aged 75 and over since the OSA 2017 report on Chapter 224.*

Adults aged 25-34 had 56% lower odds of diabetes diagnosis in 2016, compared to 2012.

*OSA Report (ibidem)

Table 19. Diabetes prevalence by age, adults

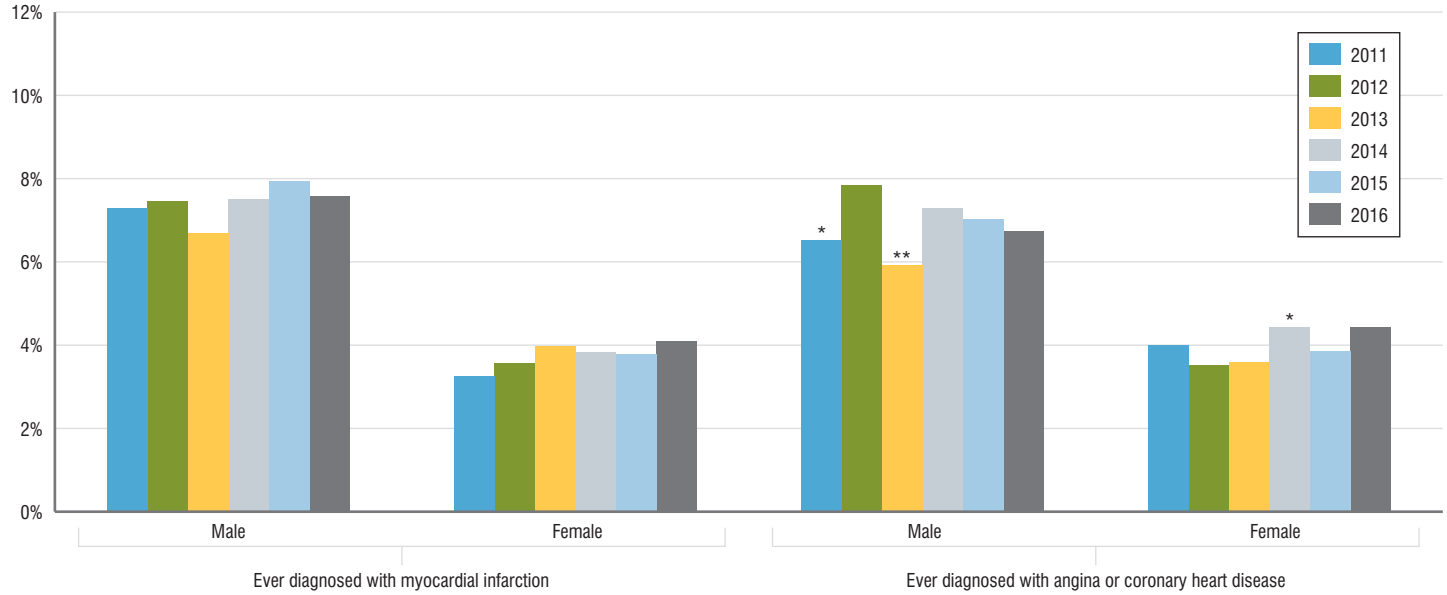


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Overall trends of heart disease (2011-2016) were stable among both males and females.

After controlling for age and year, men had 105% higher odds than women of being diagnosed with myocardial infarction, and 79% higher odds than women of being diagnosed with angina or coronary heart disease.

Table 20. Heart disease, adults aged 35 and over



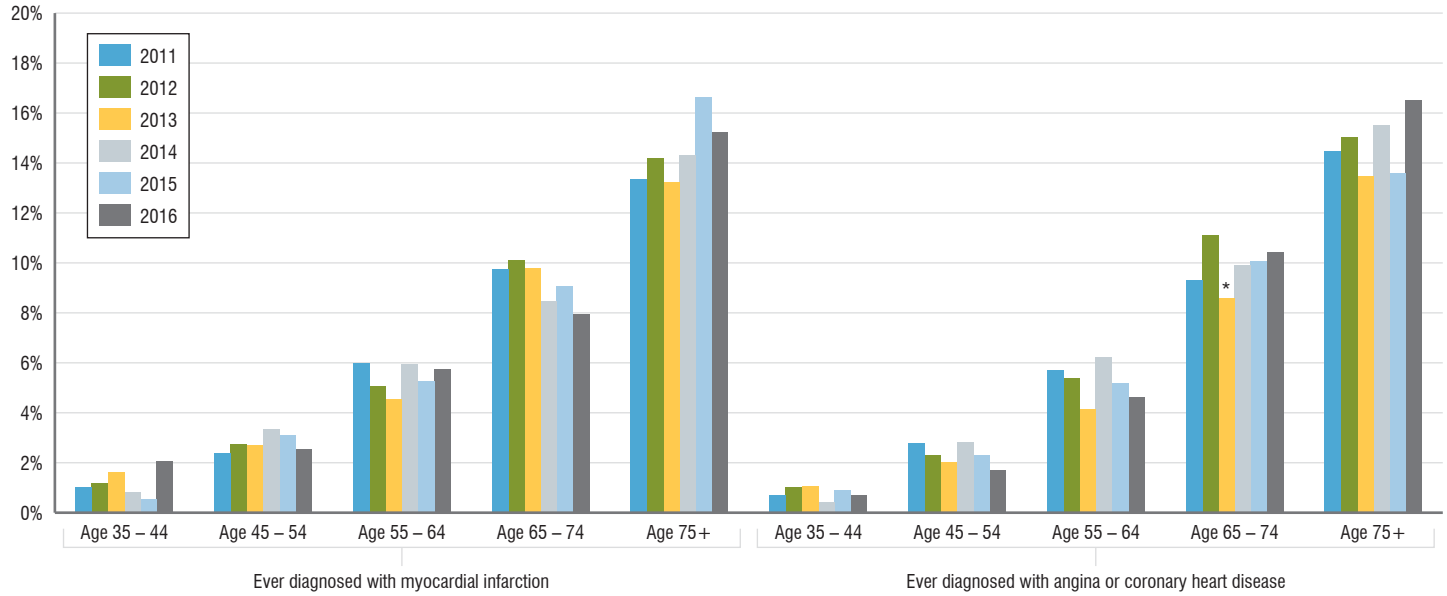
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

There were no changes in the prevalence of cardiovascular diseases among any age group in 2016, compared to 2012. Overall trends (2011-2016) were also stable among all age groups.

Given heart disease is a leading cause of death in the U.S., it is important to strengthen prevention efforts around these indicators.

Rates of heart attack in 2016 ranged from 2.1% among those aged 35-44 to 15.2% among those aged 75 and older.

Table 21. Heart disease by age, adults aged 35 and over

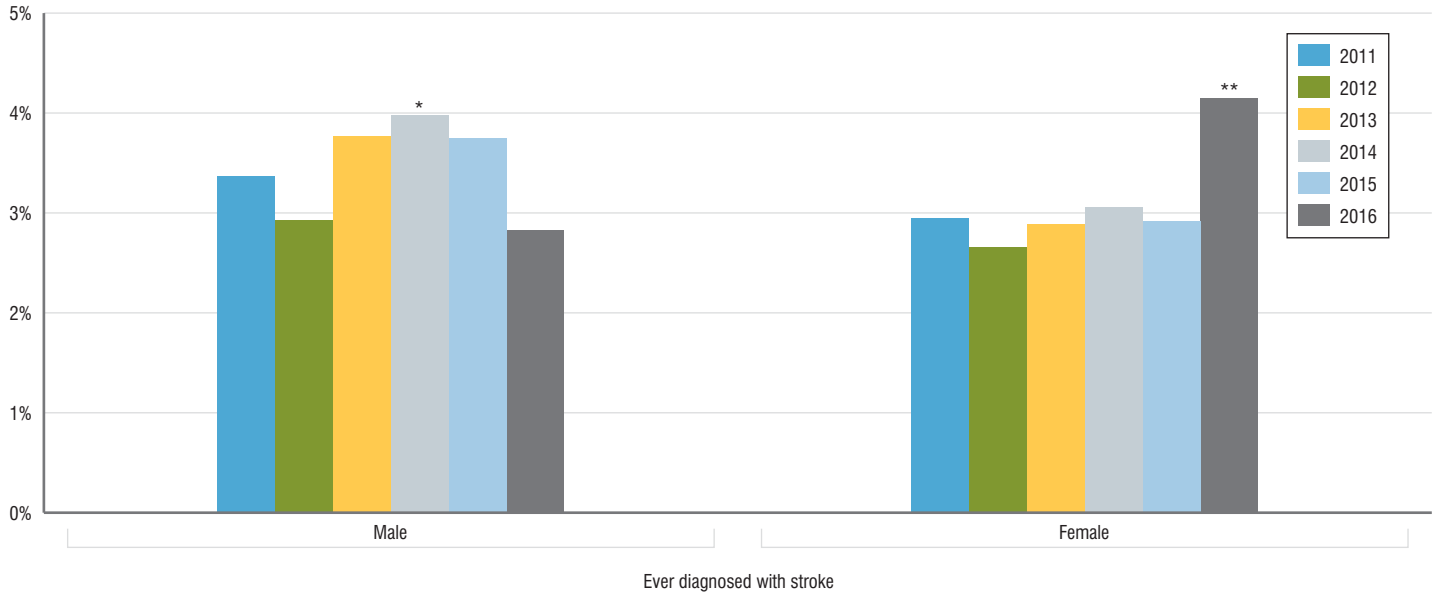


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Females had higher odds (58%) of ever being diagnosed with stroke in 2016, as compared to 2012.

The overall trend (2011-2016) also showed a significant increase among females, while there was no change among males.

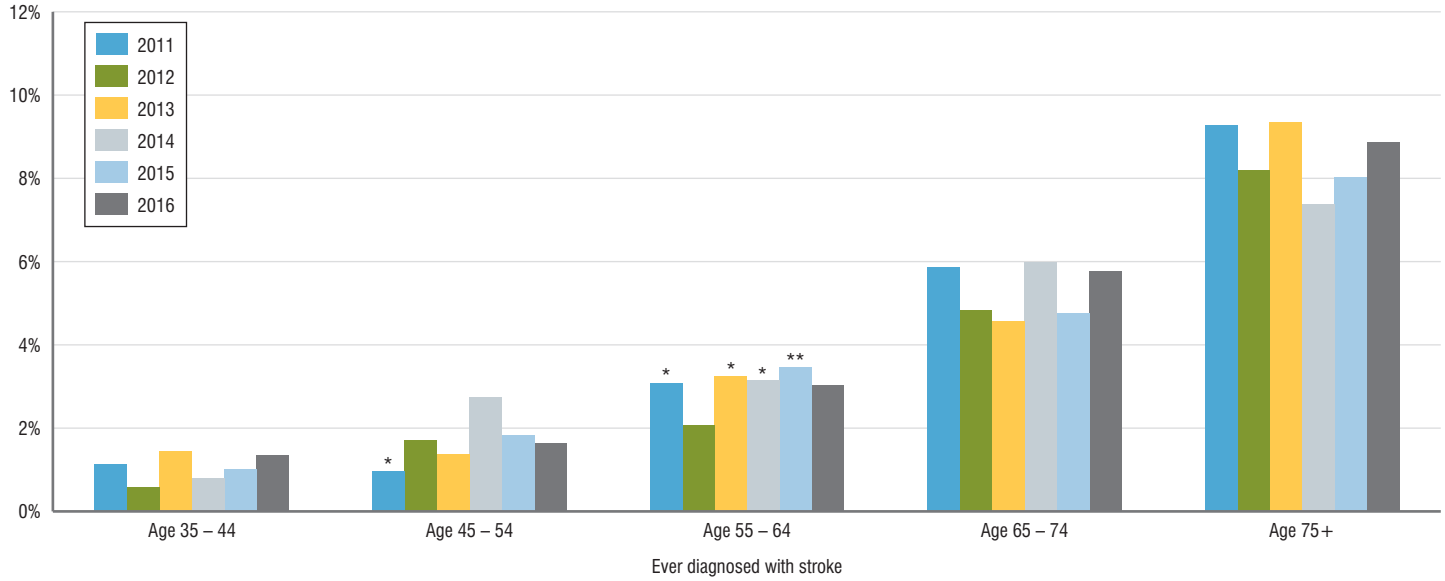
Table 22. Stroke prevalence, adults aged 35 and over



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

None of the five age groups had a significant change in odds of stroke in 2016 (compared to 2012); however, those aged 45-54 had a significant increase in the overall trend of stroke diagnosis, 2011-2016 (data not shown).

Table 23. Stroke by age, adults aged 35 and over



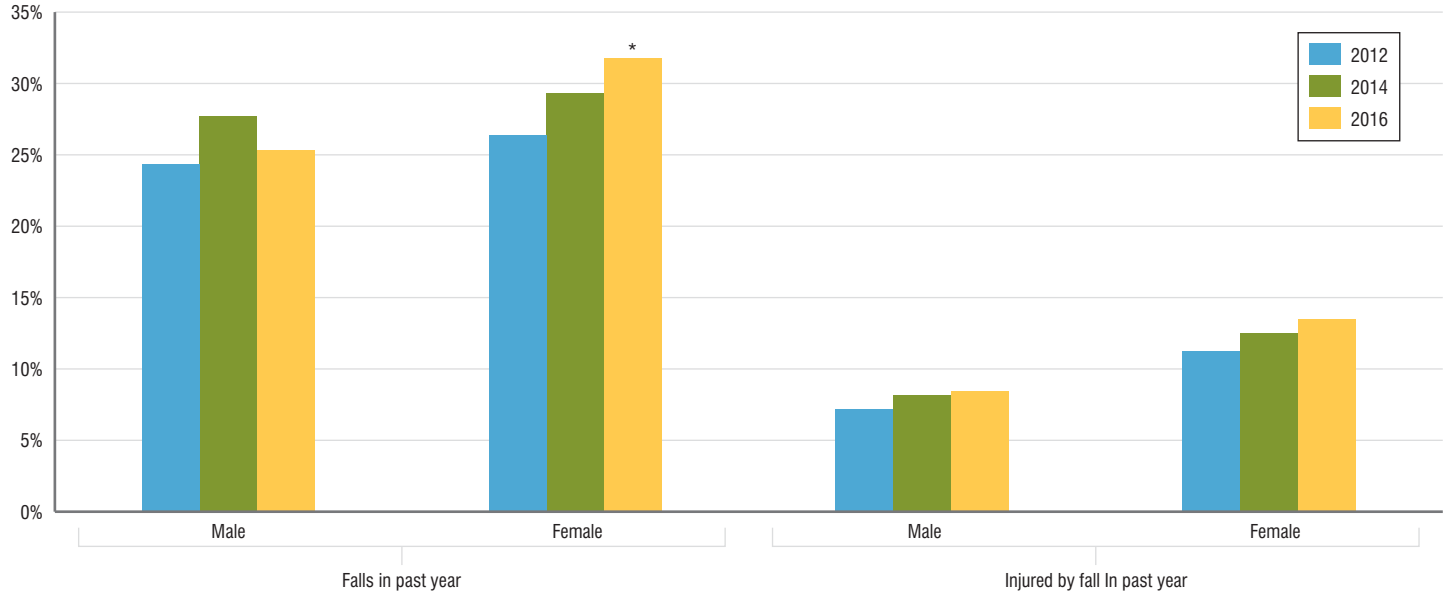
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Females experienced a significant increase in the odds of having a fall in 2016, as compared to 2012.

Neither falls among males nor injuries among either group changed significantly in the overall trend, 2012-2016.

After controlling for age and year, females had 16% greater odds of falling and 64% greater odds of being injured in the case of a fall when compared to males (data not shown).

Table 24. Fell and injured in a fall in the past year, adults aged 65 and over



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

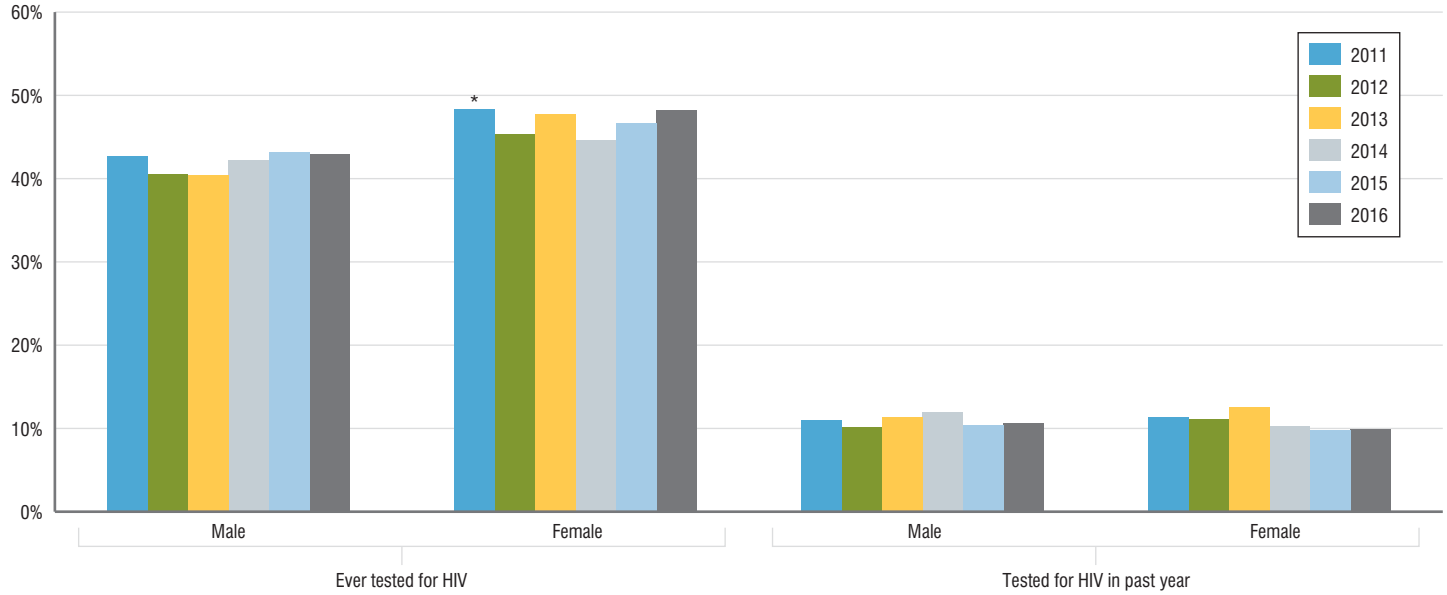
When comparing 2016 to 2012, there were no changes in odds of testing among either males or females in the near or long-term.

However, the overall trend (2011-2016) showed a significant decrease among women having a test in the past year. This indicates some lost ground since the 2017 OSA report on Chapter 224.*

After controlling for age and year, females were 18% more likely to ever have been tested for HIV compared to males (data not shown).

*OSA Report (ibidem)

Table 25. HIV testing, adults aged 18-64



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

1c. Racial/Ethnic Disparities in Health Outcomes (DPH Data)

This section presents 16 measures corresponding to the 2017 report (sub-chapter 5.3). A longitudinal analysis was conducted regarding health engagement and outcomes related to the following topics:

- Cancer screening
- Chronic conditions (including overweight/obesity and diabetes)
- Heart disease, stroke prevalence, and falls among older adults
- HIV/AIDS
- Other key risk factors, including access to medical and dental care, asthma, smoking, cholesterol, and blood pressure

Unless otherwise noted, all charts based on BRFSS data show only the year-to-year data for the chosen groups. The significance of overall trends for each group are not shown in the tables, but may be mentioned in the text if it was found to be statistically significant.

OSA conducted additional analyses, not shown in this report, which controlled for gender, age, and year, as appropriate. These additional analyses were tested for between-group differences. Some of these additional findings are shared in the text and are indicated by the notation of *(data not shown)*.

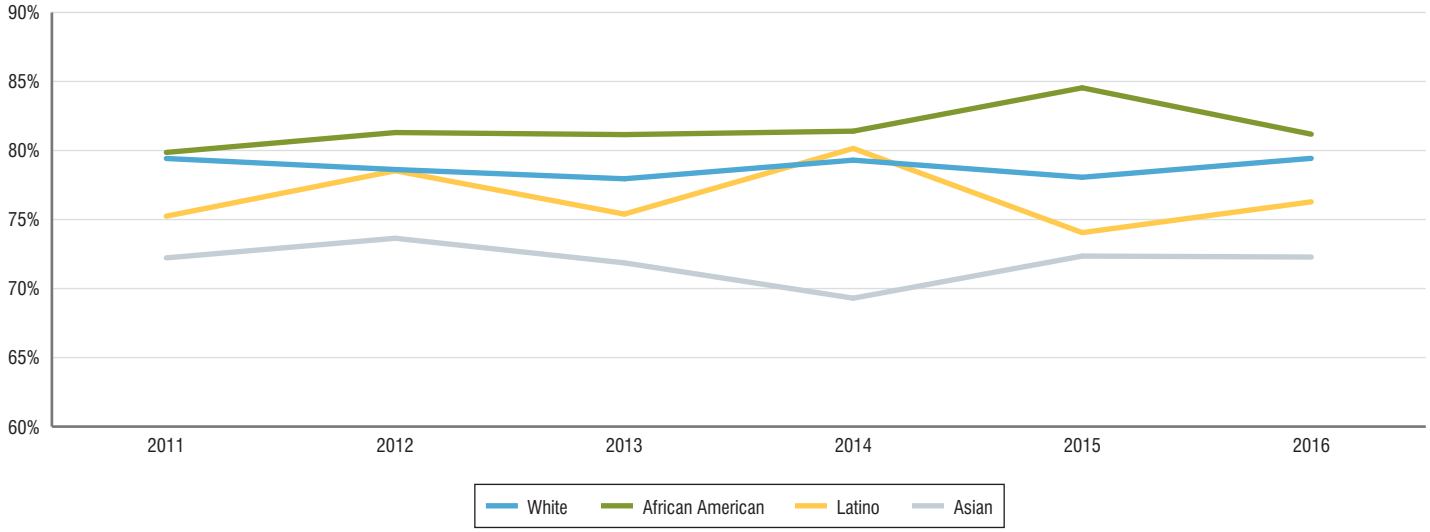
There were no changes in the odds of having a routine checkup in the past year among any racial/ethnic group in 2016, as compared to 2012.

The significant decrease among Whites for the overall trend (2011-2015) reported in the 2017 OSA report on Chapter 224* has disappeared, suggesting the overall trend was stable, 2011-2016.

After controlling for gender, age, and year, both African Americans and Latinos had a significantly higher likelihood than Whites to have a checkup (data not shown). African Americans had the highest rate in 2016 at 81.2%, and Asians had the lowest rate in 2016 at 72.3%.

*OSA Report (ibidem)

Table 26. Routine checkup in the past year, adults



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

None of the four racial/ethnic groups had higher 2016 odds, compared to 2012, of having a personal health care provider.

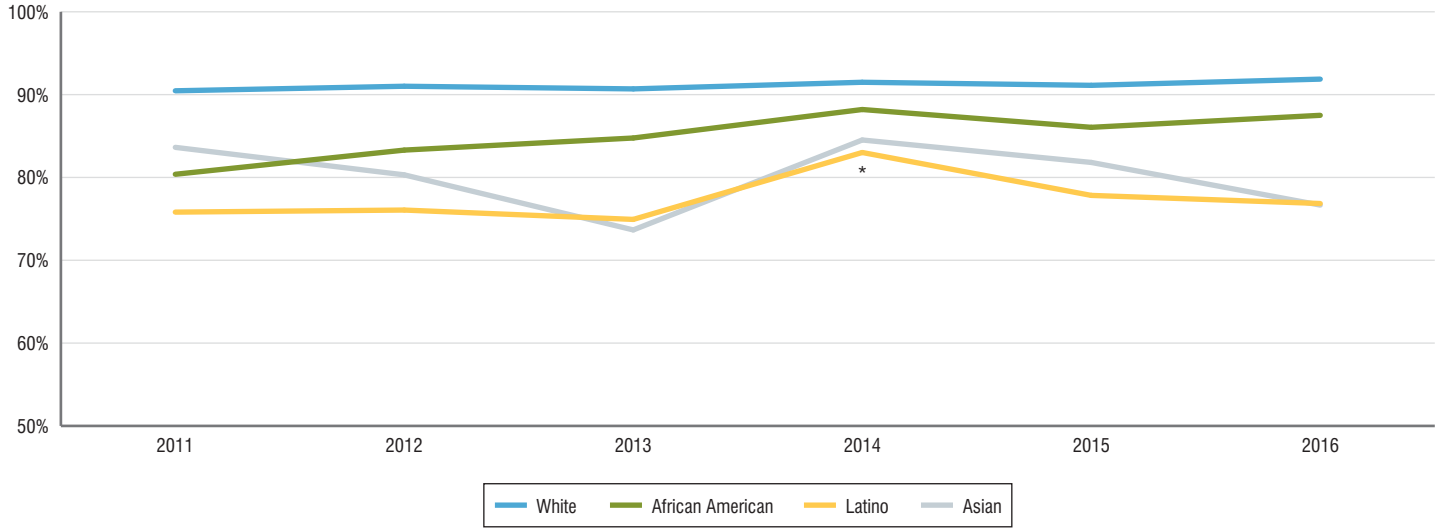
African Americans had a significant increase in overall trend, 2011-2016 (data not shown), which is a new finding since the OSA 2017 report on Chapter 224.*

After controlling for gender, age, and year, Whites had a significantly higher rate compared with all three other racial/ethnic groups (data not shown).

In 2016, Whites had the highest rate of having a personal care provider at 91.9%, and Asians had the lowest at 76.7%.

*OSA Report (ibidem)

Table 27. Has a personal health care provider, adults



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

After controlling for gender, year, and age, the odds among Latinos for not seeing a doctor due to cost were 186% higher than that among Whites.

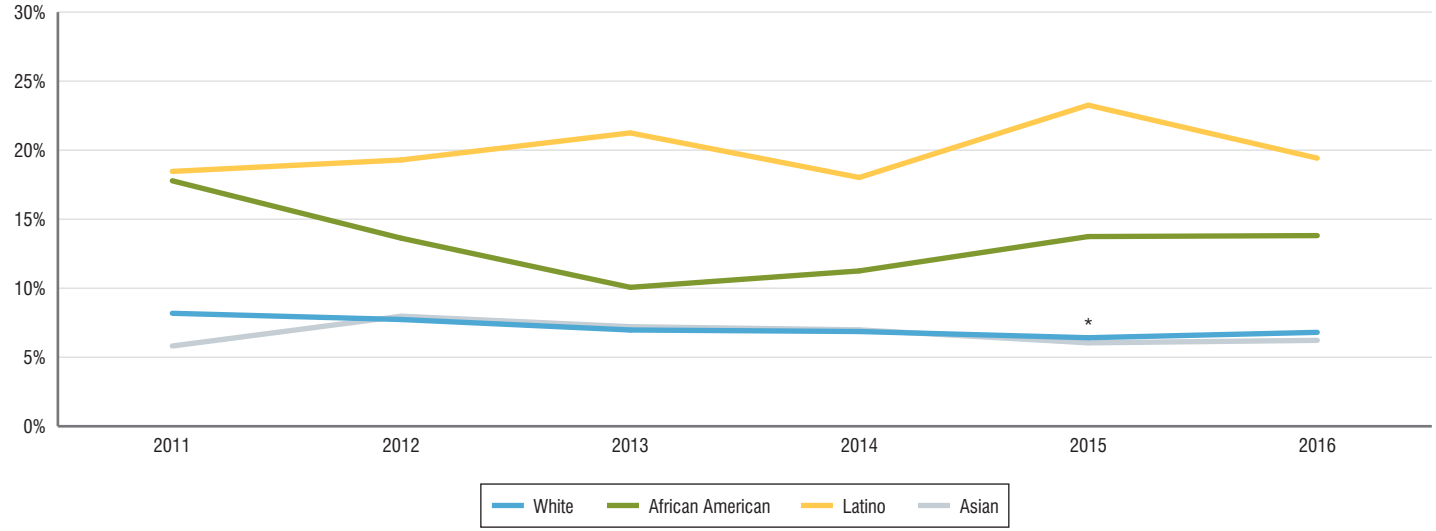
African Americans were significantly more likely than Whites to forego needed care due to costs (data not shown).

Whites had a significant decrease in the overall trend of foregoing care due to cost (2011-2016).

There were no significant changes in the odds of foregoing doctors' visits due to cost among the four groups in 2016 (compared to 2012).

Latinos had a rate of 19.4% in foregoing needed care in 2016, while Asians had a rate of 6.2% in that same year.

Table 28. Could not see a doctor due to cost, adults

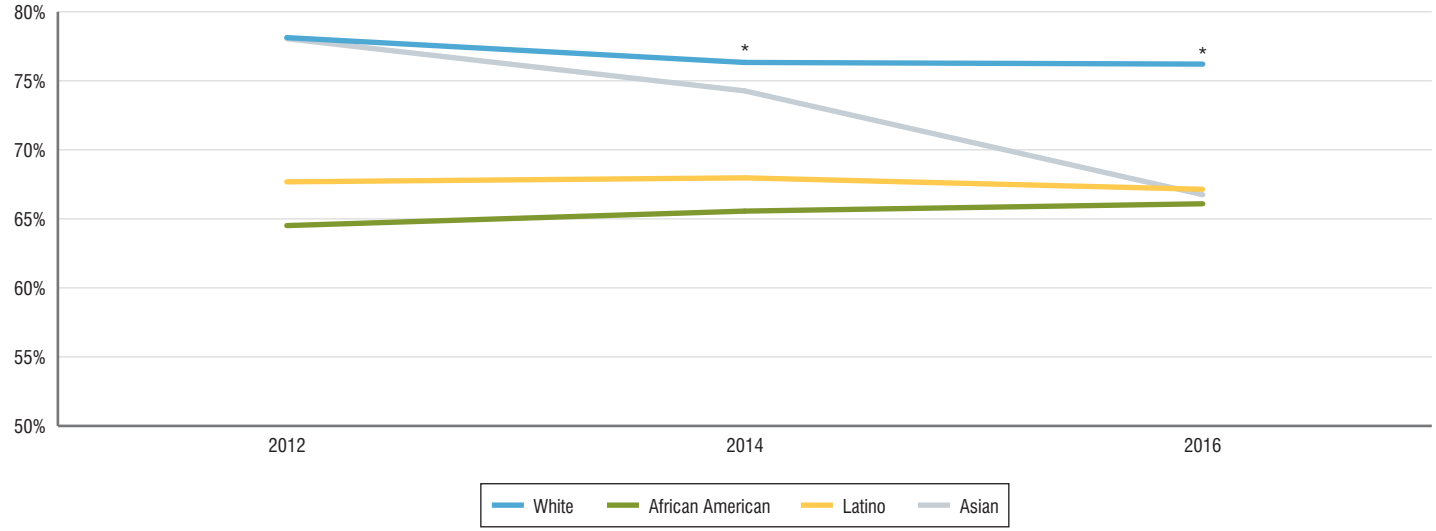


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

In 2016, only Whites had significantly lower odds of having a dental visit in the past year when compared to 2012. Both Whites and Asians had significant and decreasing overall trends, 2012-2016.

After controlling for gender, age, and year, Whites were significantly more likely than all three other racial/ethnic groups to have had a dental visit in the past year (data not shown).

Table 29. Had dental visit within a year, adults aged 50 and over

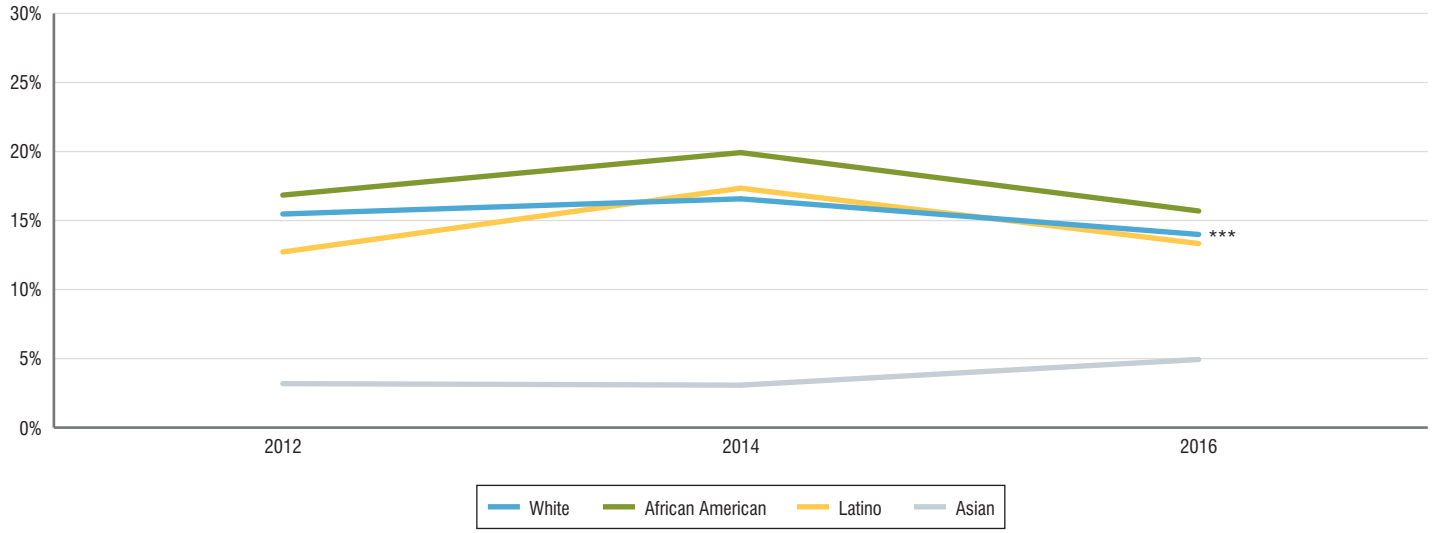


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Only Whites showed significantly lower odds of missing six or more teeth in 2016 compared to 2012. Whites also experienced a significant decrease in overall trend (2012-2016).

After controlling for gender, age, and year, African Americans had double the likelihood and Latinos had 87% higher likelihood, while Asians had only half the likelihood of Whites to have six or more missing teeth (data not shown).

Table 30. Had six or more teeth missing, adults aged 50 and over

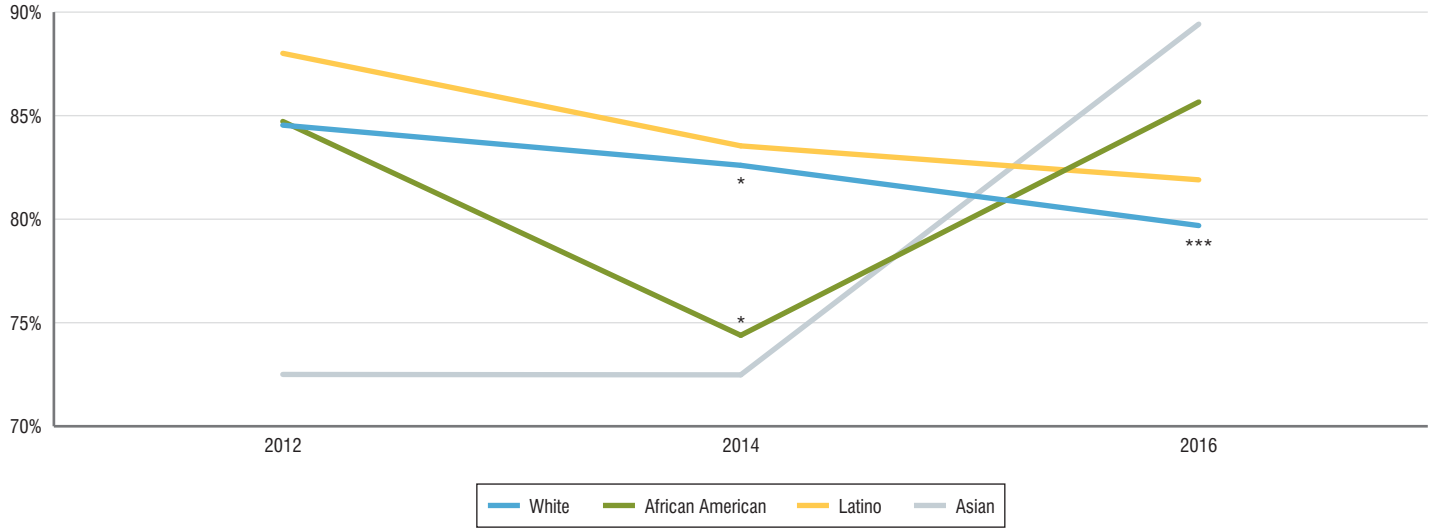


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

In 2016, only White women (aged 40 and over) had significantly lower odds of having a mammogram in the past two years when compared to 2012.

After controlling for age and year, no racial/ethnic group was significantly more or less likely than Whites to have had a mammogram (data not shown).

Table 31. Had a mammogram in the past two years, women aged 40 and over



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Both Whites and Latinos experienced significantly lower odds of having a pap smear in the past three years (2016 compared to 2012). The overall trend (2012-2016) decreased significantly among both Whites and Latinos, a new development since the 2017 OSA report.*

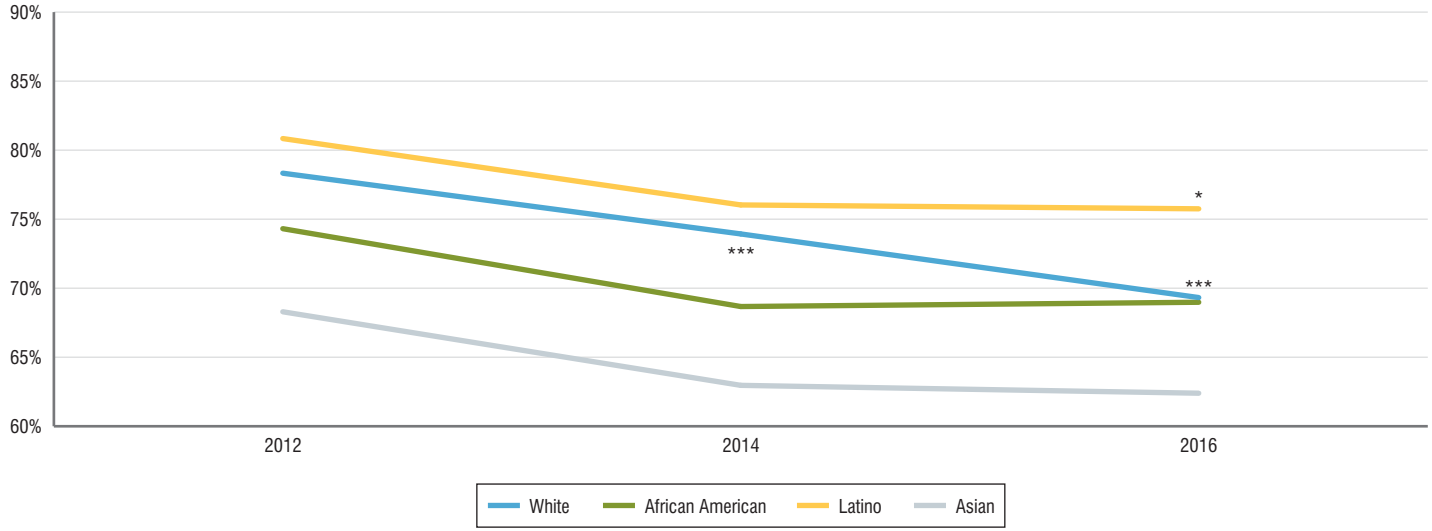
After controlling for age and year, African Americans were 25% less likely and Asians were 56% less likely to have had a pap smear than Whites (data not shown).

Latinos had the highest rate in 2016 at 75.8% and Asians had the lowest rate at 62.4%.

It is important to note the literature suggests significant variation in receiving a pap smear among sub-populations within these four groups.

*OSA Report (ibidem)

Table 32. Had a pap smear in the past three years, women aged 18 and over

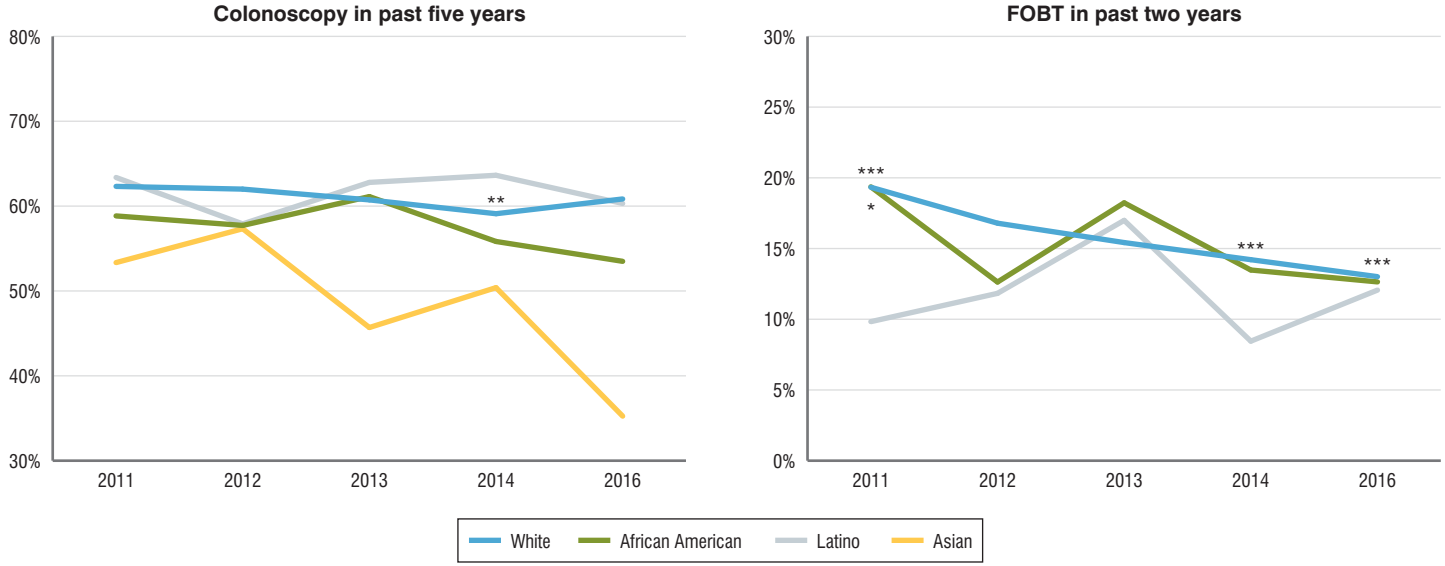


Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Only Whites saw a significant decrease in having a FOBT in the past two years, both in comparing 2016 odds to 2012, and in overall trend 2011-2016.

After controlling for gender, age, and year, only Asians had significantly lower likelihood than Whites of having a colonoscopy in the past five years.

Table 33. Colon cancer screening by test type, adults aged 50 and over

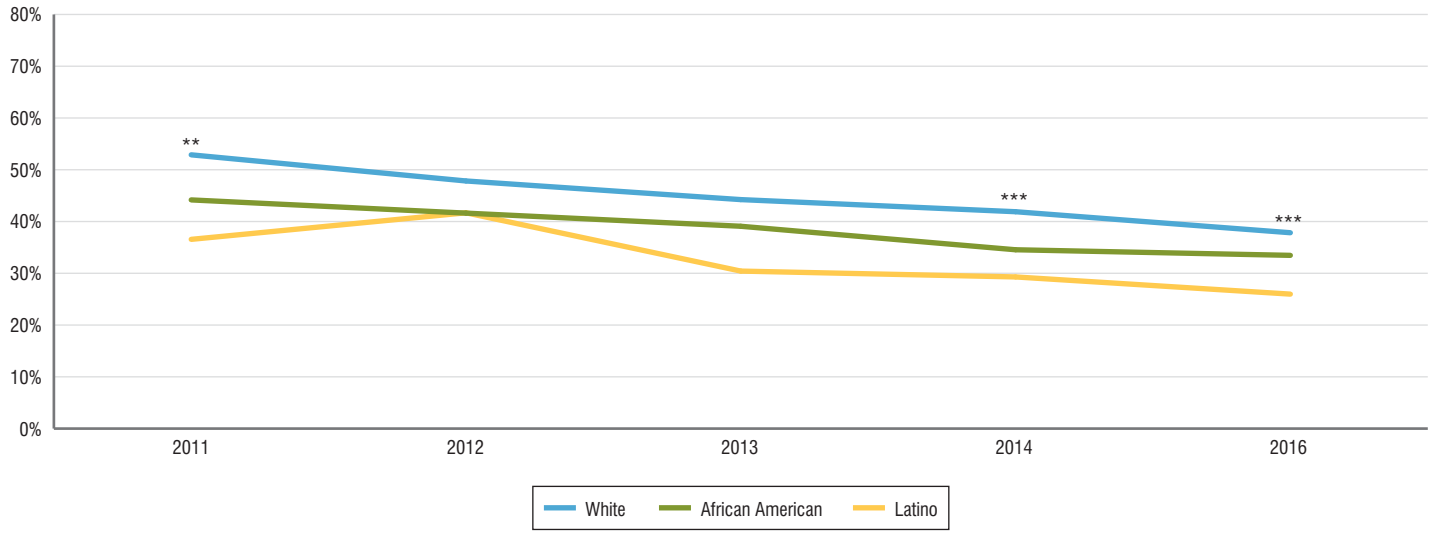


Notes: FOBT = fecal occult blood test; FOBT data were insufficient for Asians; neither question was included in the 2015 survey; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Whites were the only group with a significant decrease in odds in of having had a PSA blood test in the past year in 2016, compared with 2012.

After controlling for gender, age, and year, Latinos were significantly less likely than Whites to have had a PSA test in the past year.

Table 34. PSA blood test in the past year, men aged 50 and over



Notes: PSA = prostate-specific antigen; PSA data were insufficient for Asians; the question was not included in the 2015 survey; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

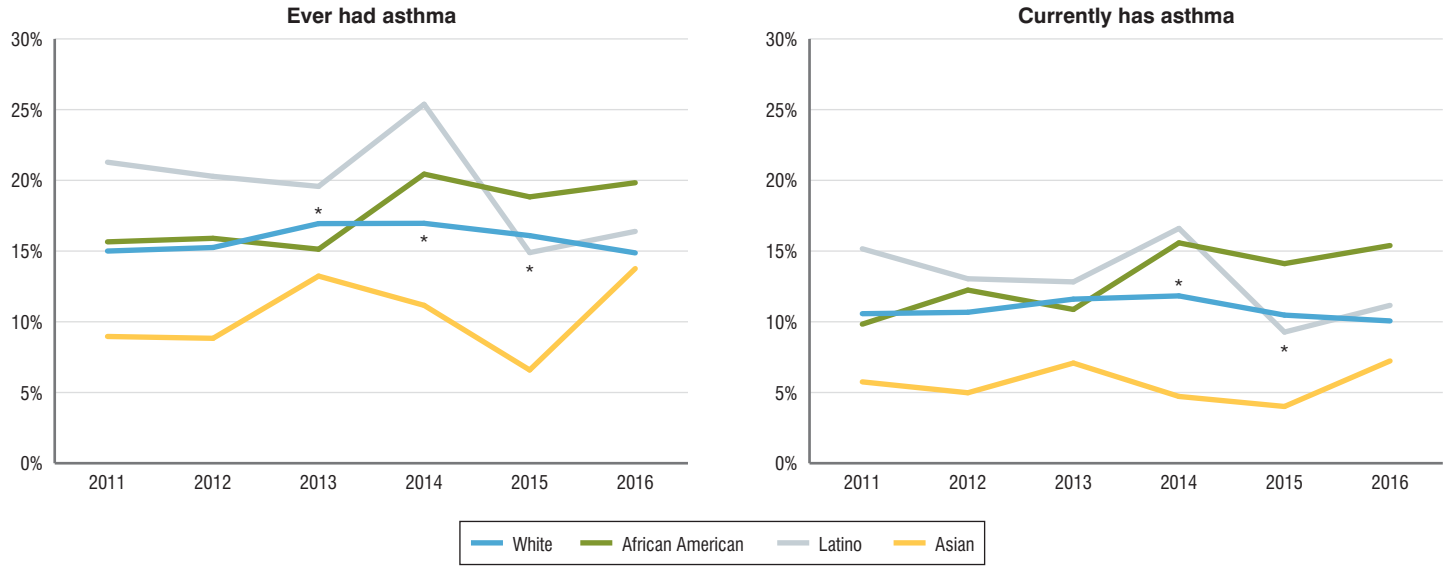
No racial/ethnic group had a change in odds of lifetime asthma or current asthma in 2016, compared to 2012.

There was a significant decrease in the overall trend (2011-2016) of lifetime and of current asthma among Latinos and a significant increase in current asthma among African Americans.

After adjusting for gender, age, and year, Asians were significantly less likely than Whites to ever have or to currently have asthma (by 46% and 55%, respectively), whereas Latinos and African Americans were more likely than Whites to currently have asthma and Latinos were more likely to have ever had asthma (data not shown).

African Americans had the highest rate of current asthma in 2016 at 15.4%, while Asians had the lowest rate at 7.2%.

Table 35. Asthma prevalence, adults



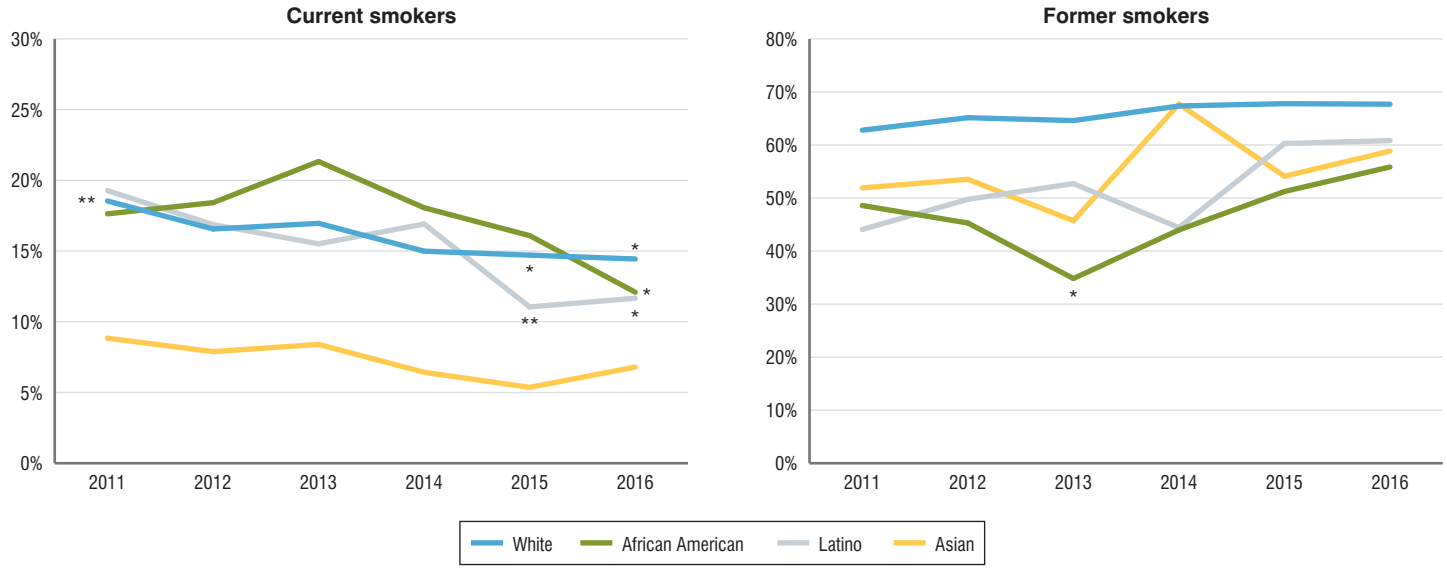
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Latinos, African Americans, and Whites had significantly decreased odds of being a current smoker in 2016 (vs. 2012). The overall trend (2011-2016) among these three groups also showed a significant decrease in current smoking.

Latinos experienced a significant increase in the overall trend for former smokers, 2011-2016.

After adjusting for gender, age, and year, Latinos and Asians were significantly less likely than Whites to be a current smoker (data not shown).

Table 36. Smoking rates, adults



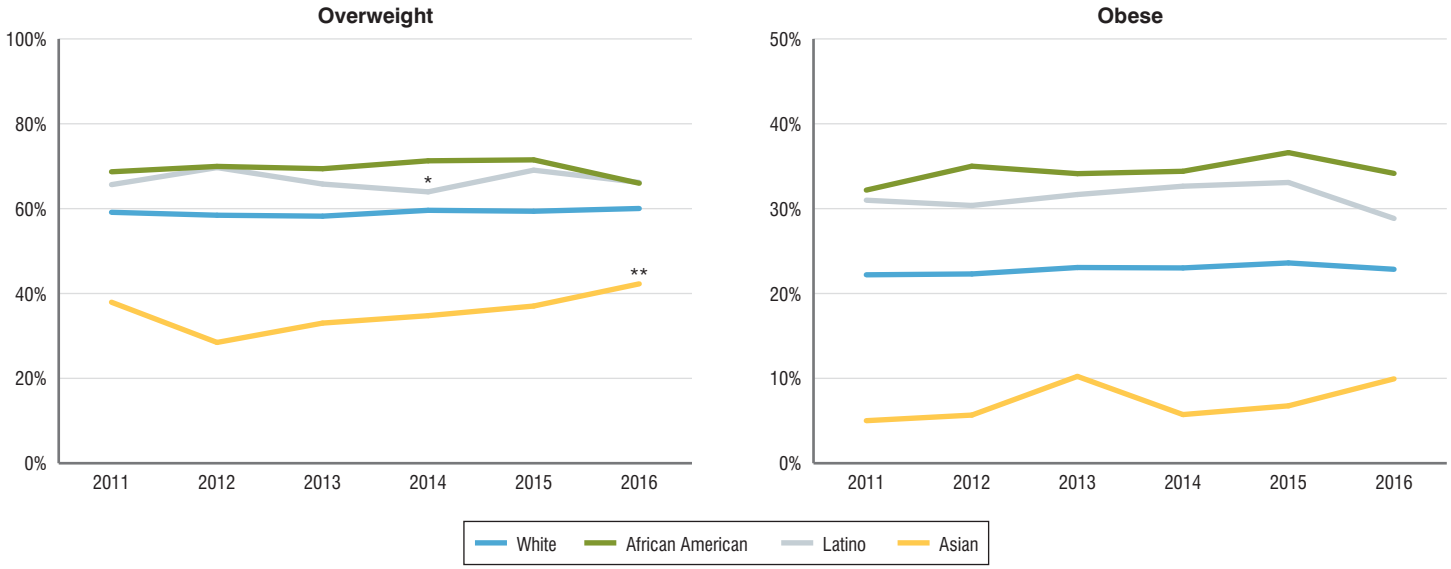
Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Only Asians had a significant increase in the odds of overweight in 2016, as compared to 2012. None of the four groups had a significant change in odds of obesity in 2016.

However, the overall trend (2011-2016) for overweight among Asians showed a newly significant increase with the addition of 2016 data (data not shown).

After adjusting for gender, age, and year, African Americans and Latinos were significantly more likely than Whites to be overweight and obese. In contrast, Asians had 56% and 69% lower odds than Whites to be overweight or obese, respectively (data not shown).

Table 37. Overweight and obesity, adults



Note: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

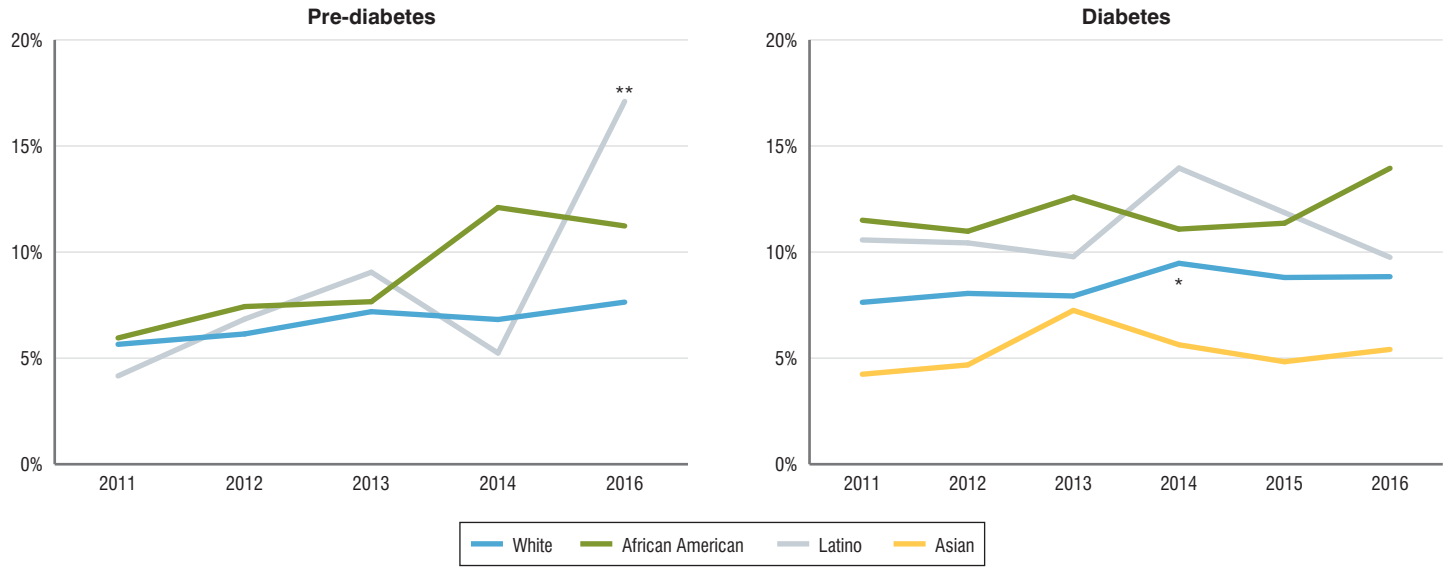
Only Latinos had greater odds (140%) of having pre-diabetes in 2016, compared to 2012. The overall trend of pre-diabetes (2011-2016) significantly increased among Latinos and Whites.

After adjusting for gender, age, and year, Asians had 36% higher odds, African Americans had 104% higher odds, and Latinos had 144% higher odds of diabetes than Whites. Whites also had significantly lower rates of pre-diabetes compared to African Americans and Latinos (data not shown).

In the OSA 2017 report on Chapter 224, a significant overall trend (2011-2015) increase was detected in pre-diabetes for African Americans and in diabetes for Whites, but the 2011-2016 trends did not reach statistical significance for either of these, suggesting slight improvements.

The diabetes prevalence in 2016 ranged from 5.4% among Asians to 14.0% among African Americans.

Table 38. Diabetes prevalence, adults



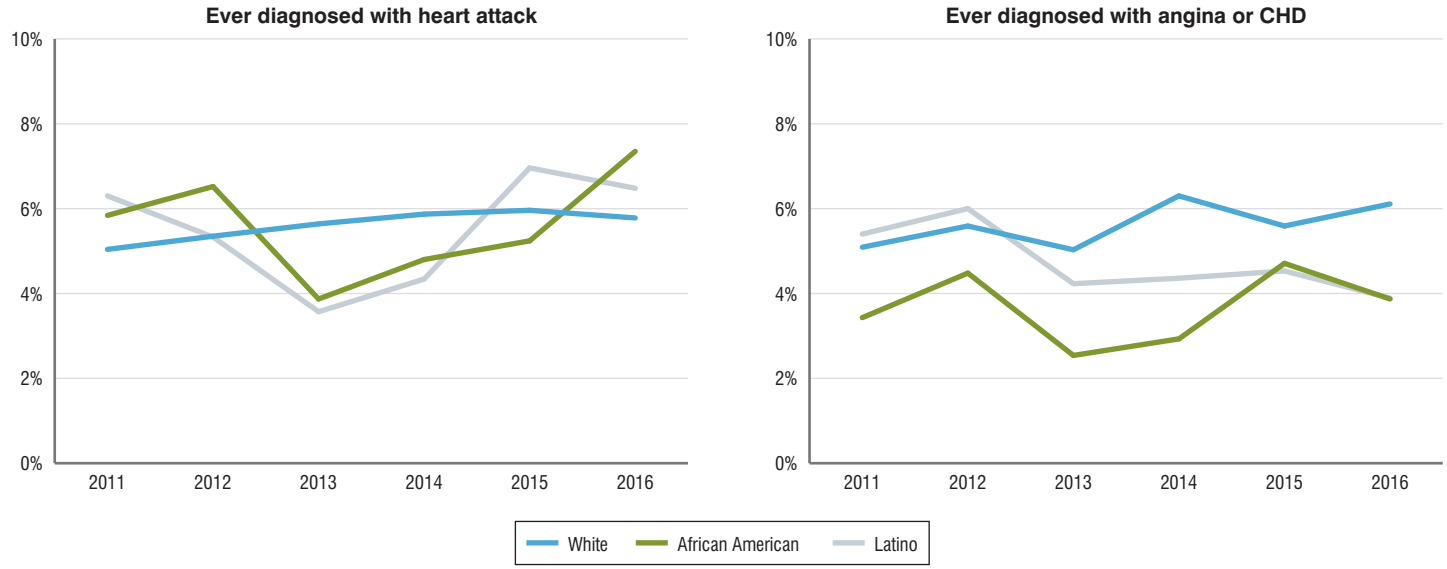
Note: The pre-diabetes question was not included in the 2015 survey; pre-diabetes data were insufficient for Asians; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

None of the three racial/ethnic groups with heart disease data had a change in odds (2016 versus 2012) of ever being diagnosed with heart attack, angina, or coronary heart disease (CHD).

After adjusting for gender, age, and year, Latinos were significantly more likely to have a heart attack (57% greater) or angina or CHD (36% greater) than Whites (data not shown).

The 2016 prevalence of heart attack ranged from 5.8% among Whites to 7.4% among African Americans. The rate of angina or CHD in 2016 ranged from 3.9% among Latinos and African Americans to 6.1% among Whites.

Table 39. Heart disease prevalence, adults aged 35 and over



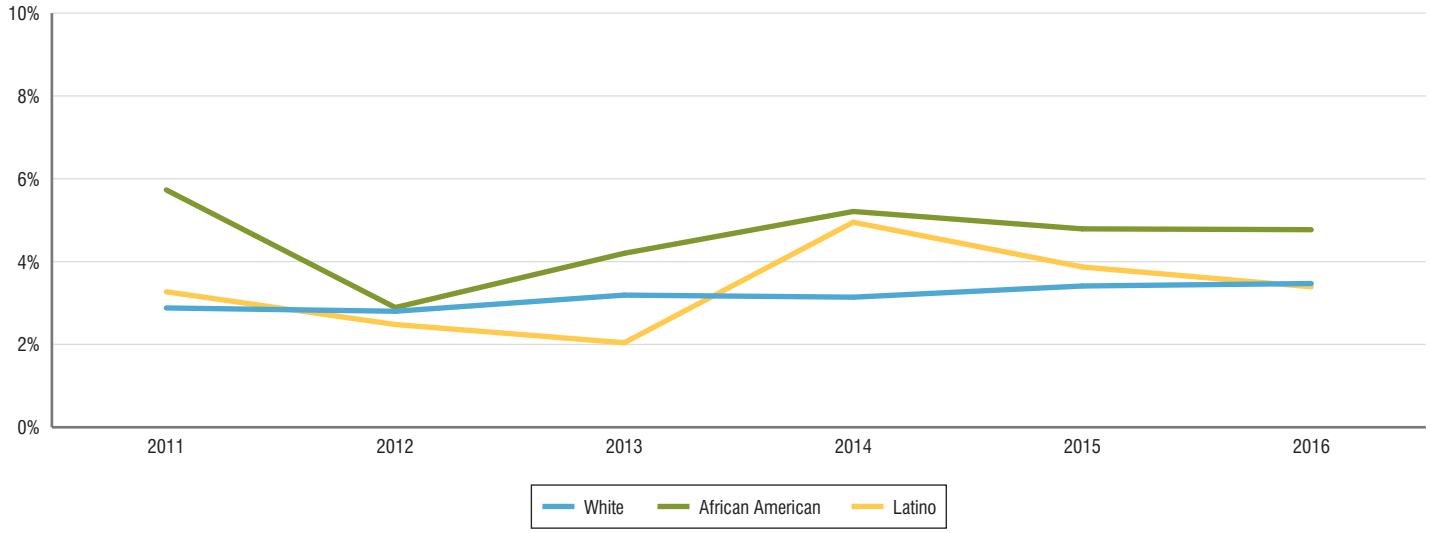
Note: CHD = coronary heart disease; data were insufficient for Asians; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

None of the three racial/ethnic groups with stroke data had a change in odds (2016 compared to 2012) or in overall trend (2011-2016) of stroke diagnosis.

After adjusting for gender, age, and year, the odds of stroke diagnosis among African Americans and Latinos were 83% and 61%, respectively, greater than the odds among Whites (data not shown).

The 2016 rate of ever having been diagnosed with a stroke was greatest among African Americans at 4.8% and lowest among Latinos at 3.4%.

Table 40. Ever diagnosed with a stroke, adults aged 35 and over



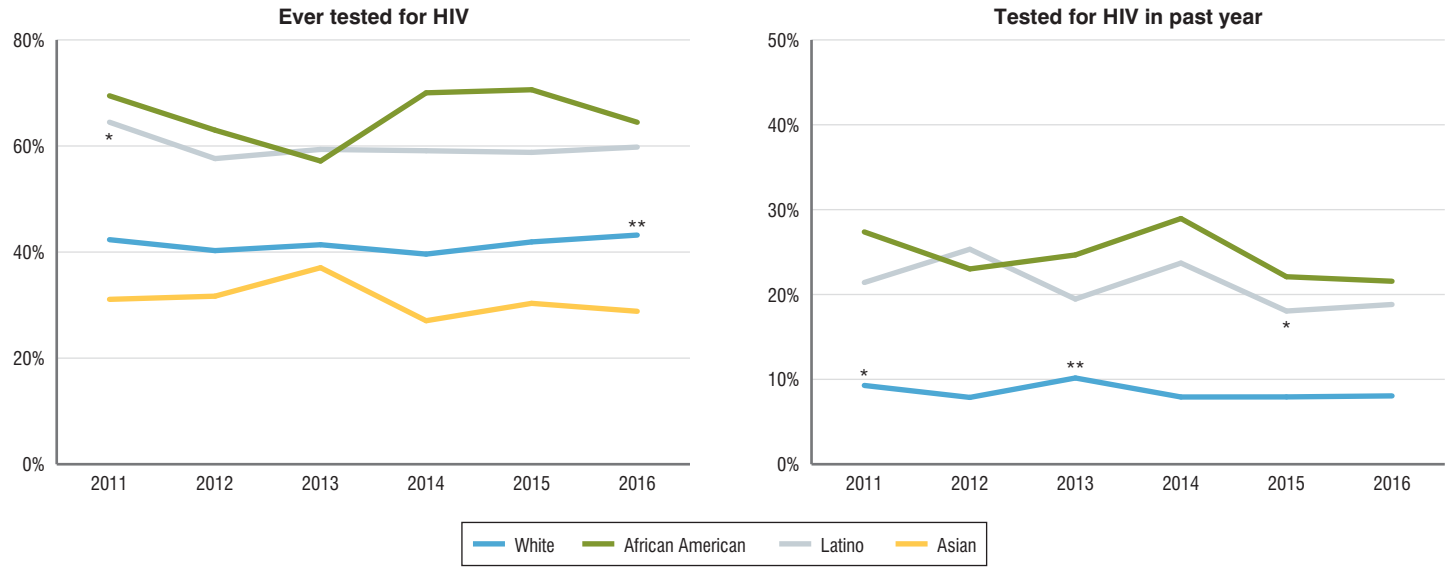
Note: Data were insufficient for Asians; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

Only Whites had a significant increase in odds of ever having been tested for HIV (15.2% greater in 2016 vs. 2012). No group saw a significant change in the odds of being tested in the past year.

No overall trend significantly changed (2011-2016).

After controlling for gender, age, and year, African Americans and Latinos had significantly higher odds of ever being tested and of testing in the past year compared to Whites. In contrast, Asians had a significantly lower likelihood of ever being tested (data not shown).

Table 41. HIV testing, adults aged 18-64



Note: Past-year HIV testing data were insufficient for Asians; statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Source: OSA analysis of Behavioral Risk Factor Surveillance System data, provided by Massachusetts Department of Public Health.

APCD and MassHealth Data

In the 2017 report on Chapter 224, we presented Odds Ratios for all longitudinal measures, which allowed us to identify more easily changes from 2012 to 2015.

In our work on the 2018 report, there was a large reduction in data reported to CHIA for APCD6, creating concerns of systematic variation, which would then introduce greater bias into findings for this report.

To respond to the change in available data, OSA used a different statistical procedure. Instead of Odds Ratios,* we used Relative Risk. Relative Risk was a better fit for the new data and is an appropriate approach for observational cohort studies such as this.

MassHealth data did not have the same problem; however, to be consistent, we utilized the same Relative Risk analyses as with the commercial data.

*To see the results of using Odds Ratios for both commercial and MassHealth, see the Addendum of this report.

2a. Reducing Preventable Health Conditions (APCD and MassHealth Data)

This section presents one measure corresponding to the 2017 report (sub-chapter 5.1): Cervical cancer screening, for women 24 to 64.

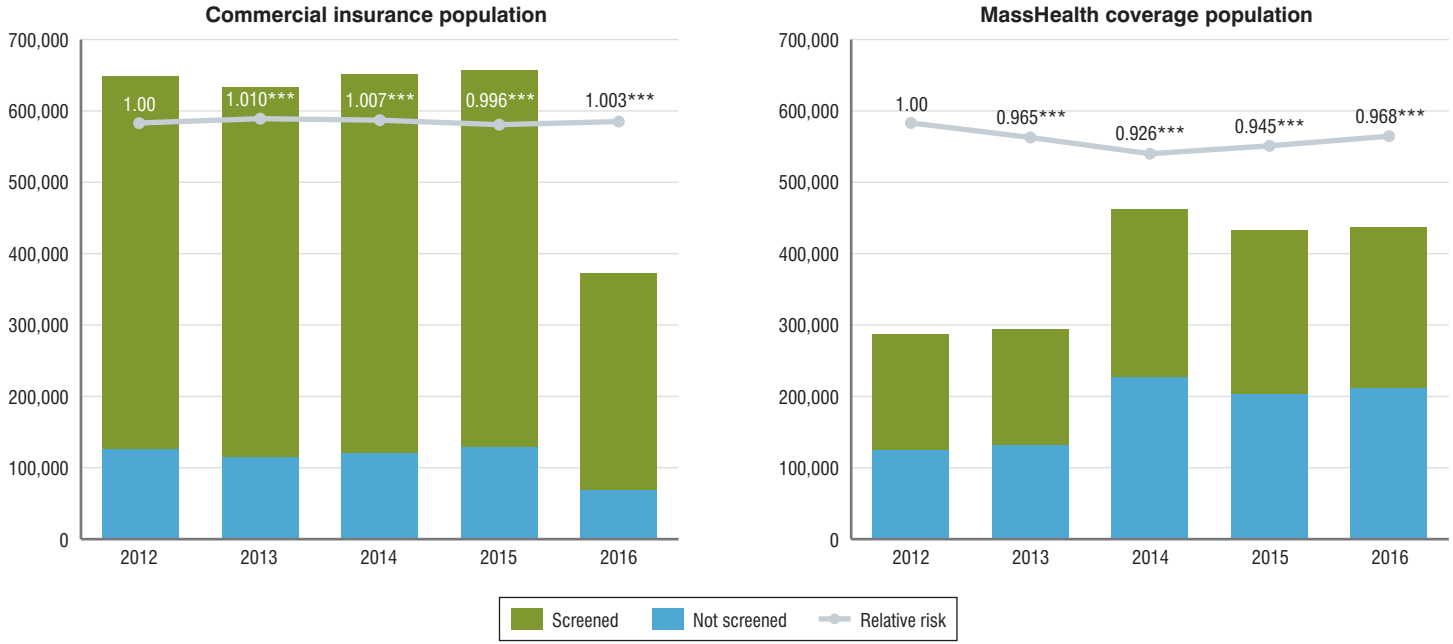
A Relative Risk analysis was conducted to explore the differences between 2012 and 2016.

MassHealth members had significantly lower likelihood (3%) of cervical cancer screening in 2016, when compared to 2012.

For women with commercial coverage, the 2016 likelihood of screening was 0.3% higher than in 2012.

The significant gap between commercial and MassHealth continues with the same trend, about 30 percentage points in magnitude, and did not change from 2012 to 2016.

Table 42. Cervical Cancer Screening, women 24-64



2 b). Access and Quality of Care (APCD and MassHealth Data)

This section presents nine measures corresponding to the 2017 report (sub-chapters 2.1-2.3).

These tables include NCQA quality measures related to well-care visits, access to primary care, lead screening, cancer screening, and inappropriate imaging for lower back pain.

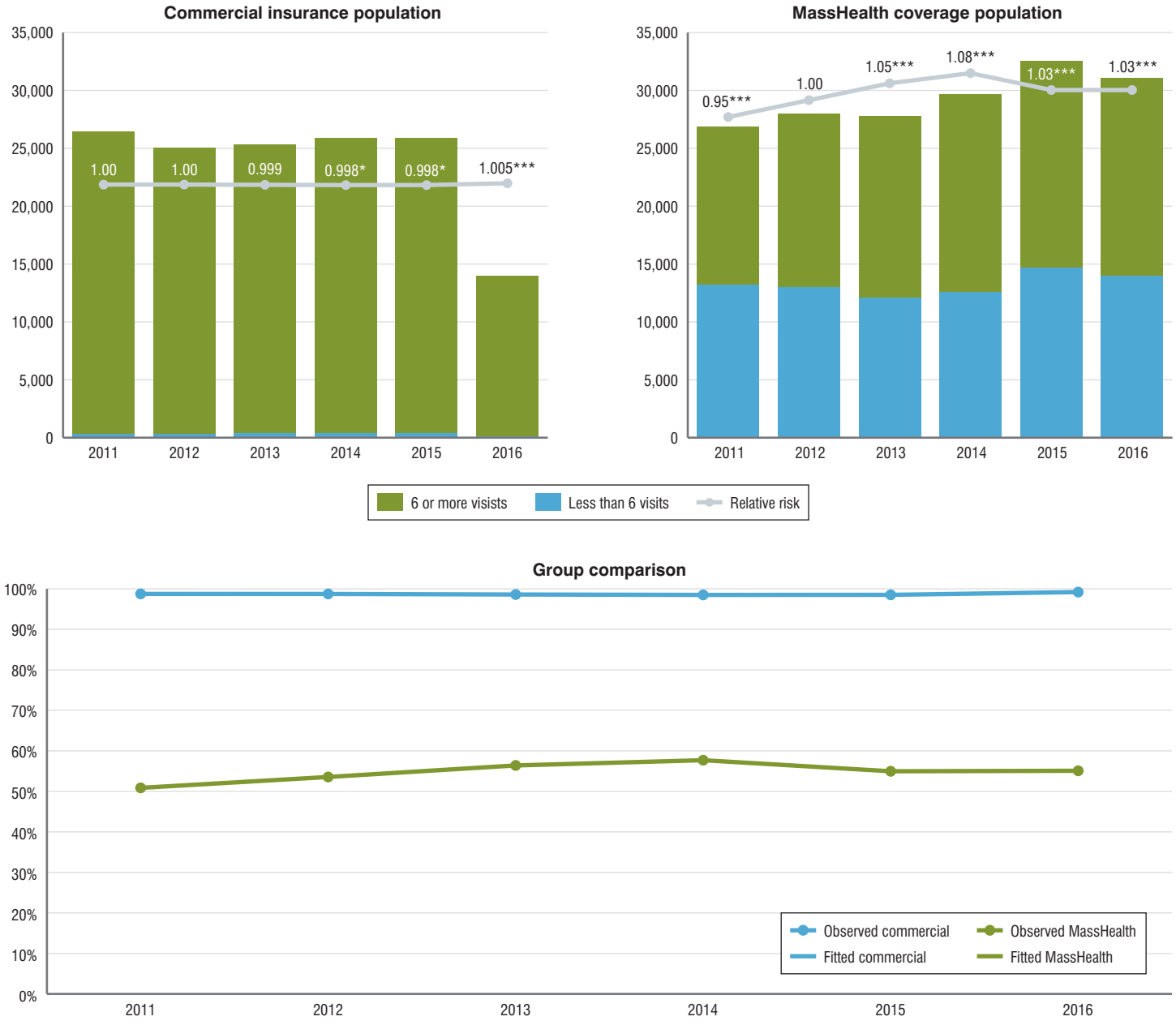
A Relative Risk analysis was conducted to explore the differences between 2012 and 2016.

Table 43. Well-child visits in the first 15 months

MassHealth members were more likely (3%) to have six or more well-child visits in the first 15 months of life in 2016, when compared to 2012.

For children with commercial coverage, there was a slight increase of .05% from 2012 to 2016. For children with MassHealth coverage, the increase was 3% for the same period.

The gap between commercial and MassHealth continues without significant changes, with about a 40% difference.



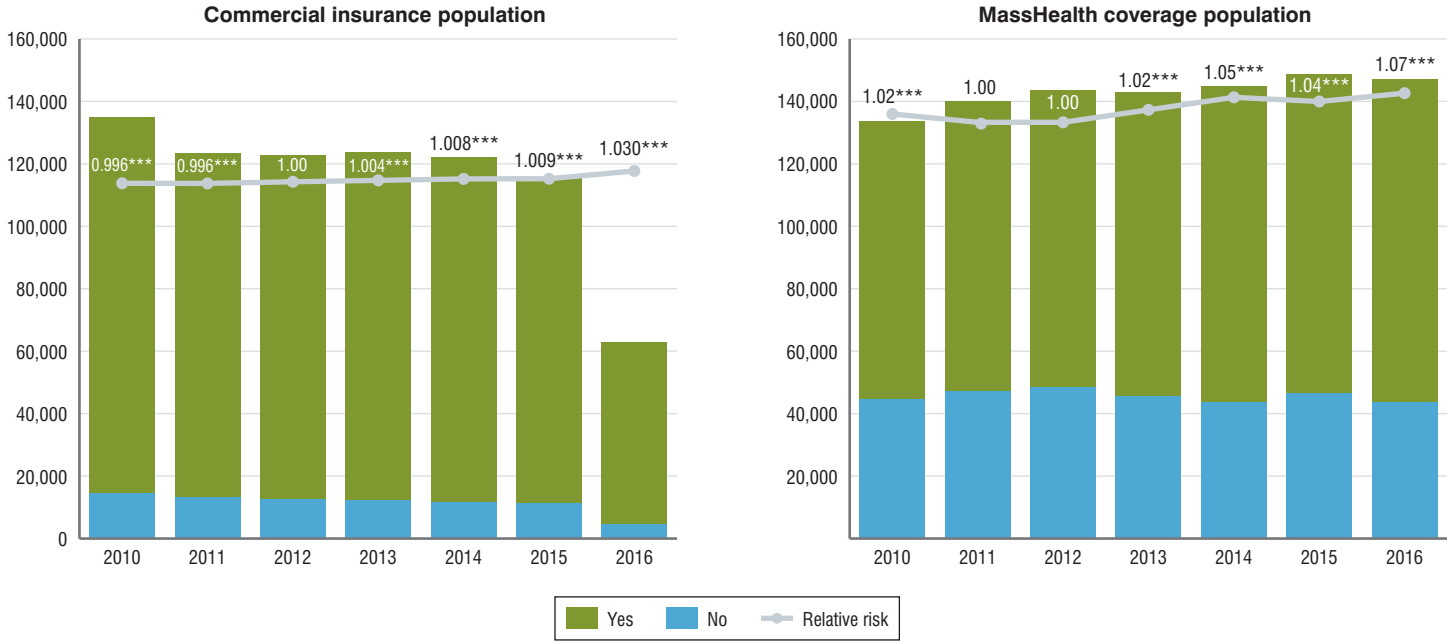
Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

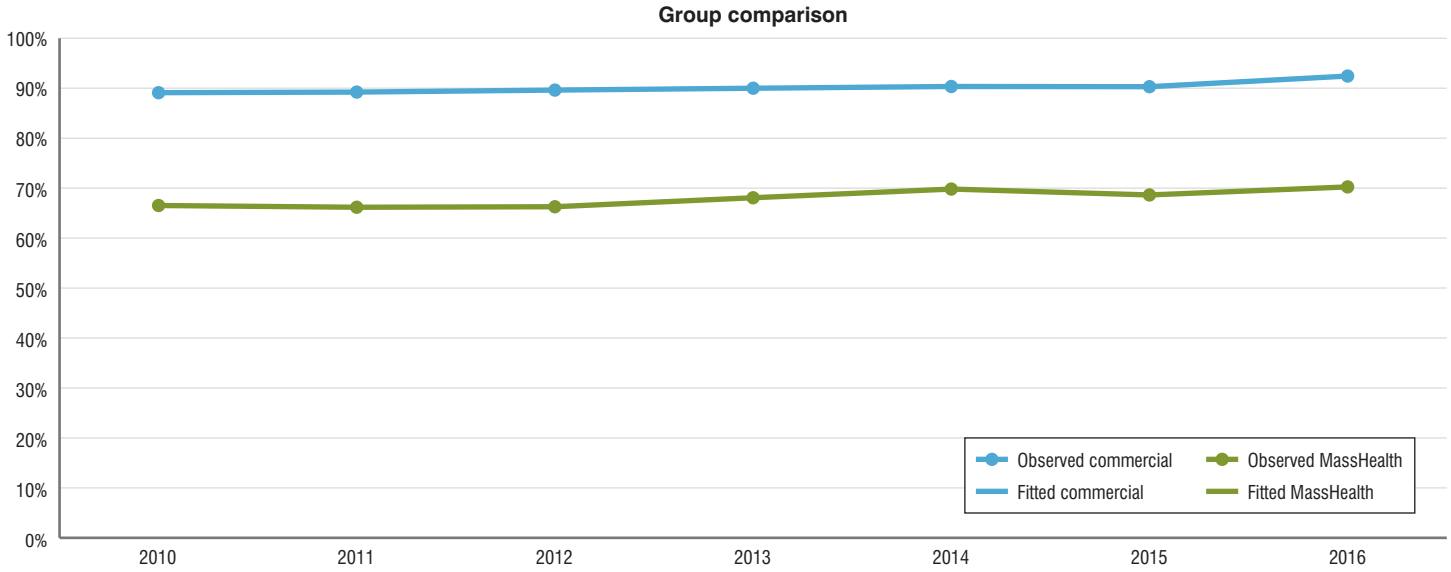
Table 44. Well-child visits from 3 to 6 years

MassHealth members aged 3-6 years had significantly higher likelihood (7%) of one or more well-child visits in 2016, when compared to 2012.

For children with commercial coverage, the 2016 likelihood was 3% higher than in 2012.

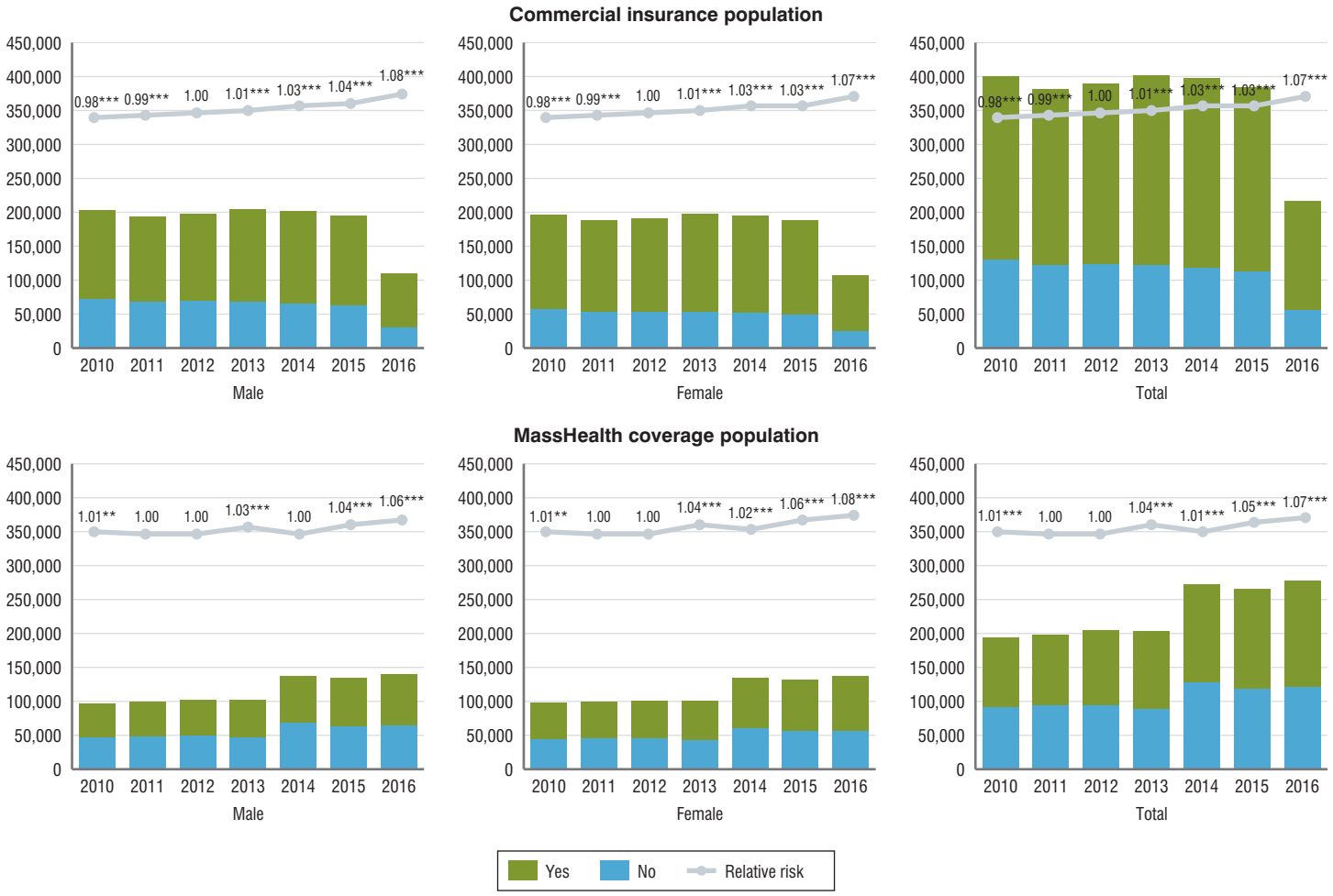
The difference between APCD and MassHealth-covered children was over 20 percentage points in magnitude in 2016 and did not change.





Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Table 45. Well-care visits in last year among 12-21 year olds

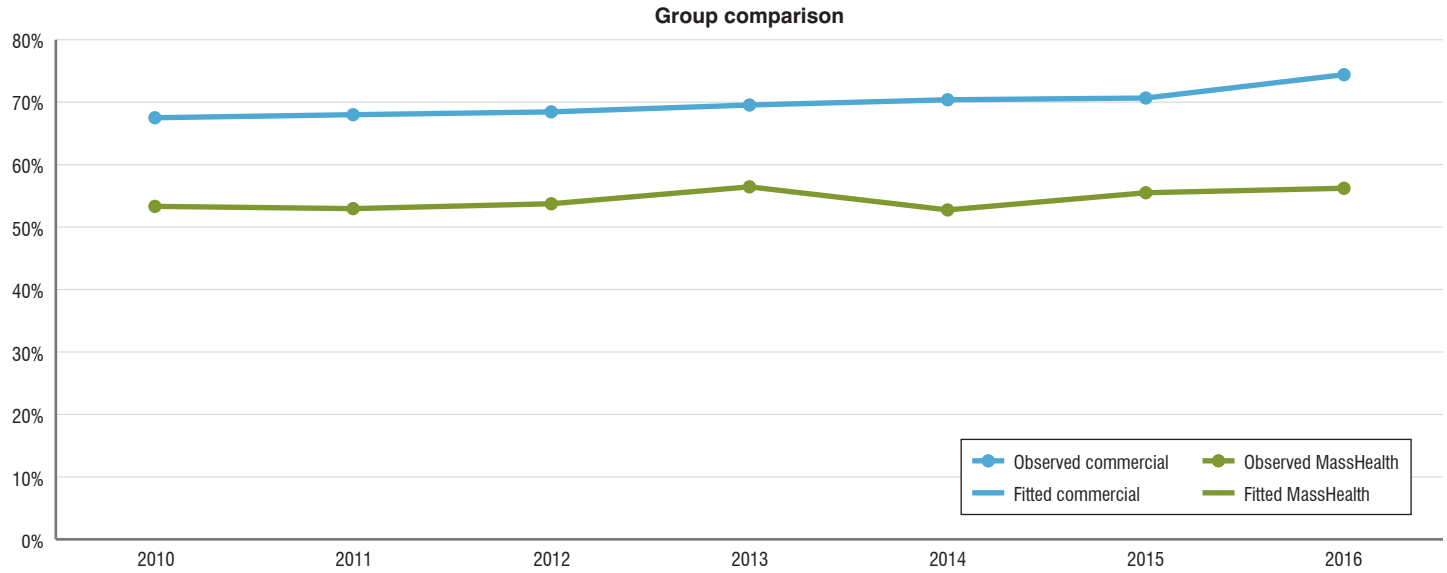


Both commercial and MassHealth members aged 12-21 years had significantly higher likelihood about 7% of one or more well-care visits in 2016, when compared to 2012, with slightly better improvement among females with MassHealth and among males with commercial coverage.

After controlling for age and other data, females had a higher visit rate than males in both groups (data not shown).

With well-care visits, the gap between children covered by MassHealth and those covered commercially was nearly 20 percentage points and increased slightly between 2010 and 2016.

Table 45 (con't). Well-care visits in last year among 12-21 year olds



Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD and MassHealth data.

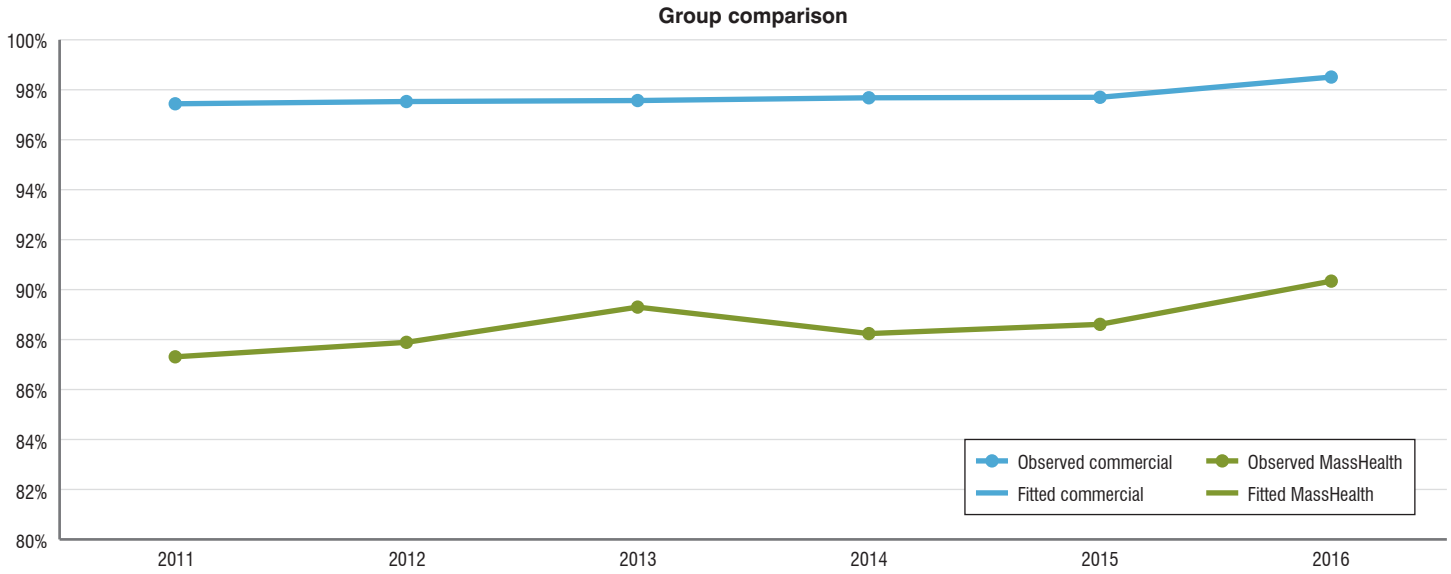
MassHealth members aged 1-19 years had significantly higher likelihood (2.5%) of access to primary care providers in 2016, when compared to 2012, with an increase among the older cohort accounting for this improvement.

For those with commercial coverage, the 2016 likelihood was 0.9% higher than in 2012.

Table 46. Access to primary care, aged 1-19 years

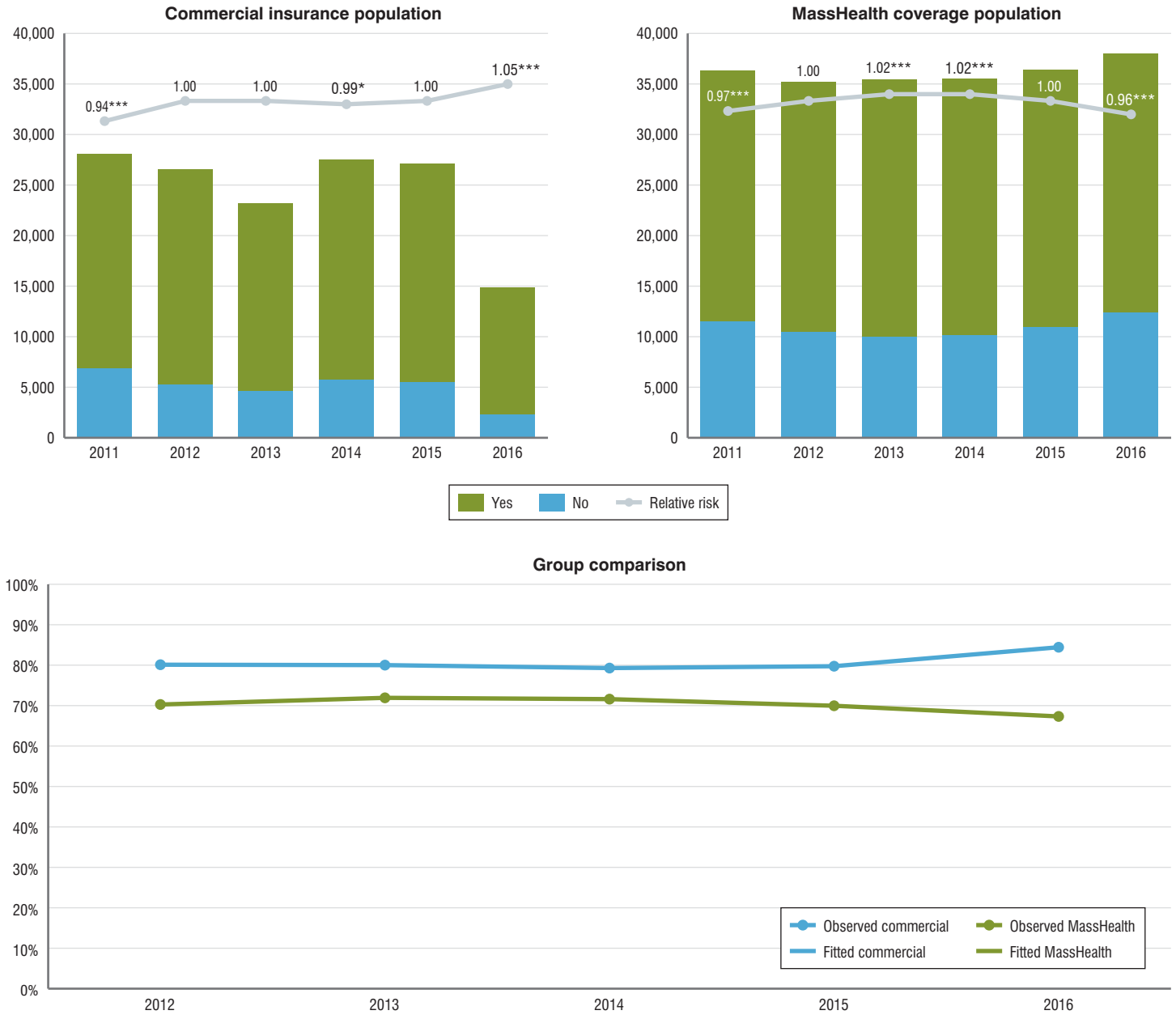
There continued to be a significant difference between commercially- and MassHealth-covered children, approximately 8 percentage points in magnitude (2016), with no significant change measured over the years.

Table 46 (con't). Access to primary care, aged 1-19 years



Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Table 47. Lead screening in children aged 2



For the commercial population, there was a slight increase of 5% in lead screening for children 2 years of age from 2012 to 2016.

For children covered by MassHealth, there was a decrease of 4% in screening.

The gap between the MassHealth and commercial populations continues to widen, with the difference at more than 15 % in 2016; in 2012, the difference was less than 10 percent.

Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Table 48. Osteoporosis management post-fracture, women aged 67-85

Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

When comparing 2016 to 2012, women covered by MassHealth who had a fracture in the past 6 months saw no change in likelihood of receiving either a bone density test or a prescription to treat osteoporosis.

In contrast, commercially covered women were 37% more likely to receive timely osteoporosis management in 2016 (vs. 2012).

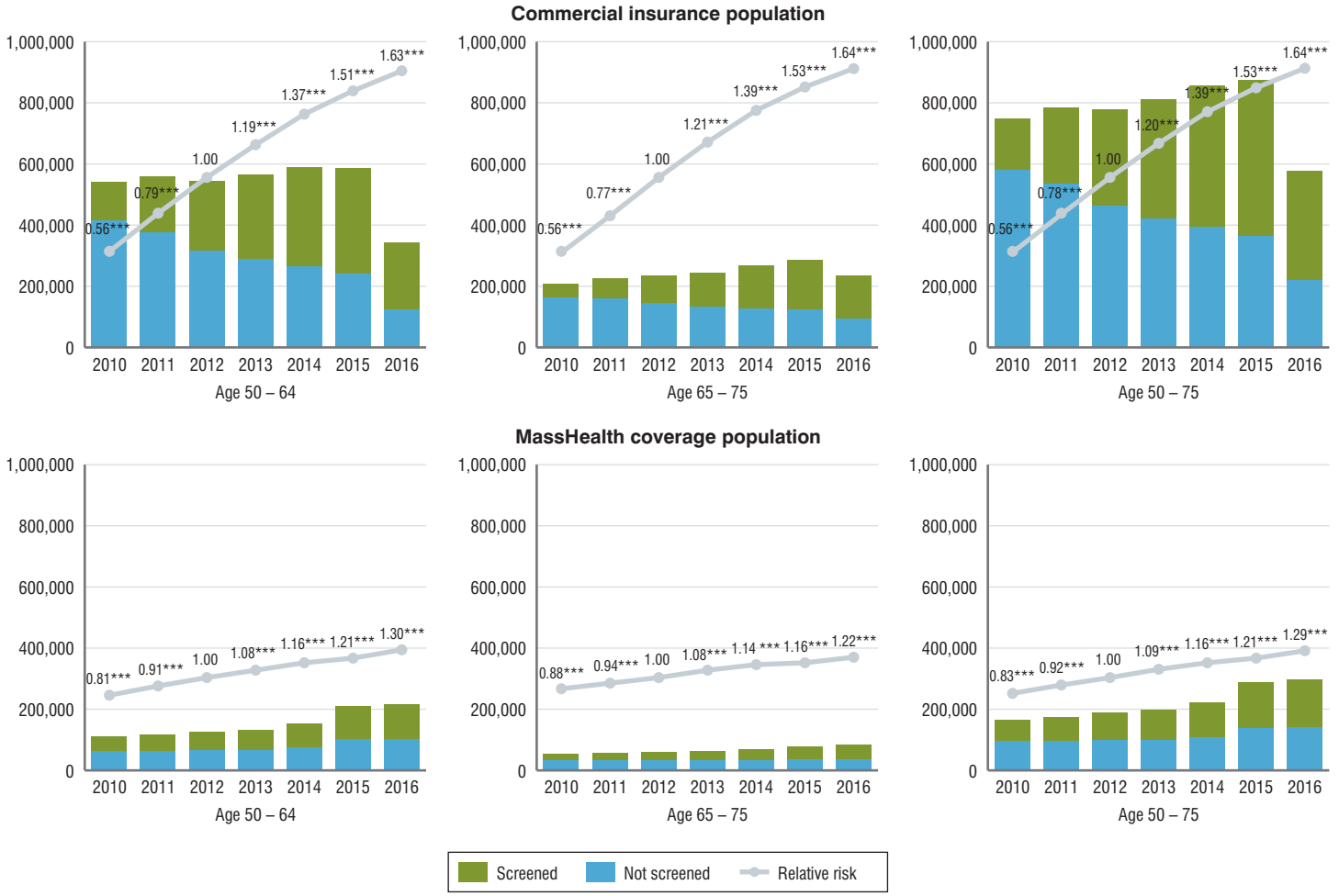
There was no significant difference in rate of timely osteoporosis management between commercially- and MassHealth-covered women.

MassHealth members had significantly higher likelihood (29%) of appropriate colorectal cancer screening in 2016, as compared to 2012.

For those with commercial coverage, the 2016 likelihood of screening was 64% higher than in 2012.

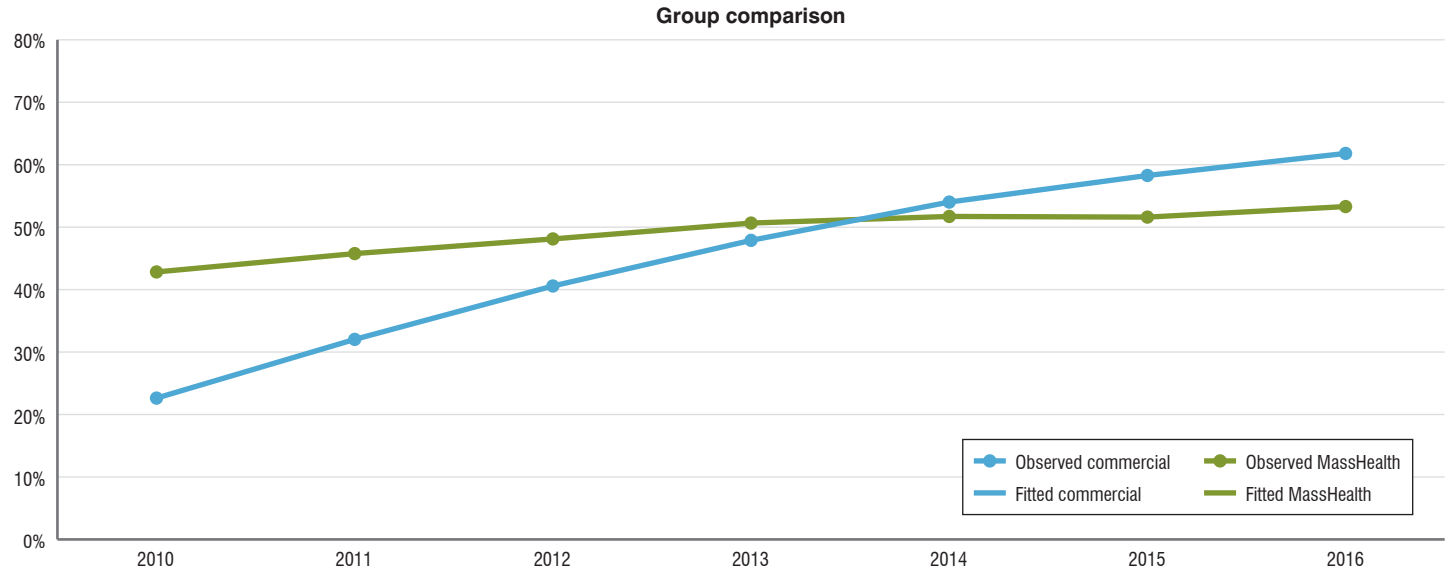
Interestingly, commercially covered females were less likely to receive appropriate screening than their male counterparts, but the opposite was true among MassHealth members (data not shown).

Table 49. Appropriate screening for colorectal cancer, adults aged 65-75



The difference between commercial and MassHealth-covered adults changed dramatically; those with commercial coverage went from 20 percentage points less likely to 8 percentage points more likely than MassHealth members to receive appropriate screening for colorectal cancer in 2016.

Table 49 (con't). Appropriate screening for colorectal cancer, adults aged 65-75

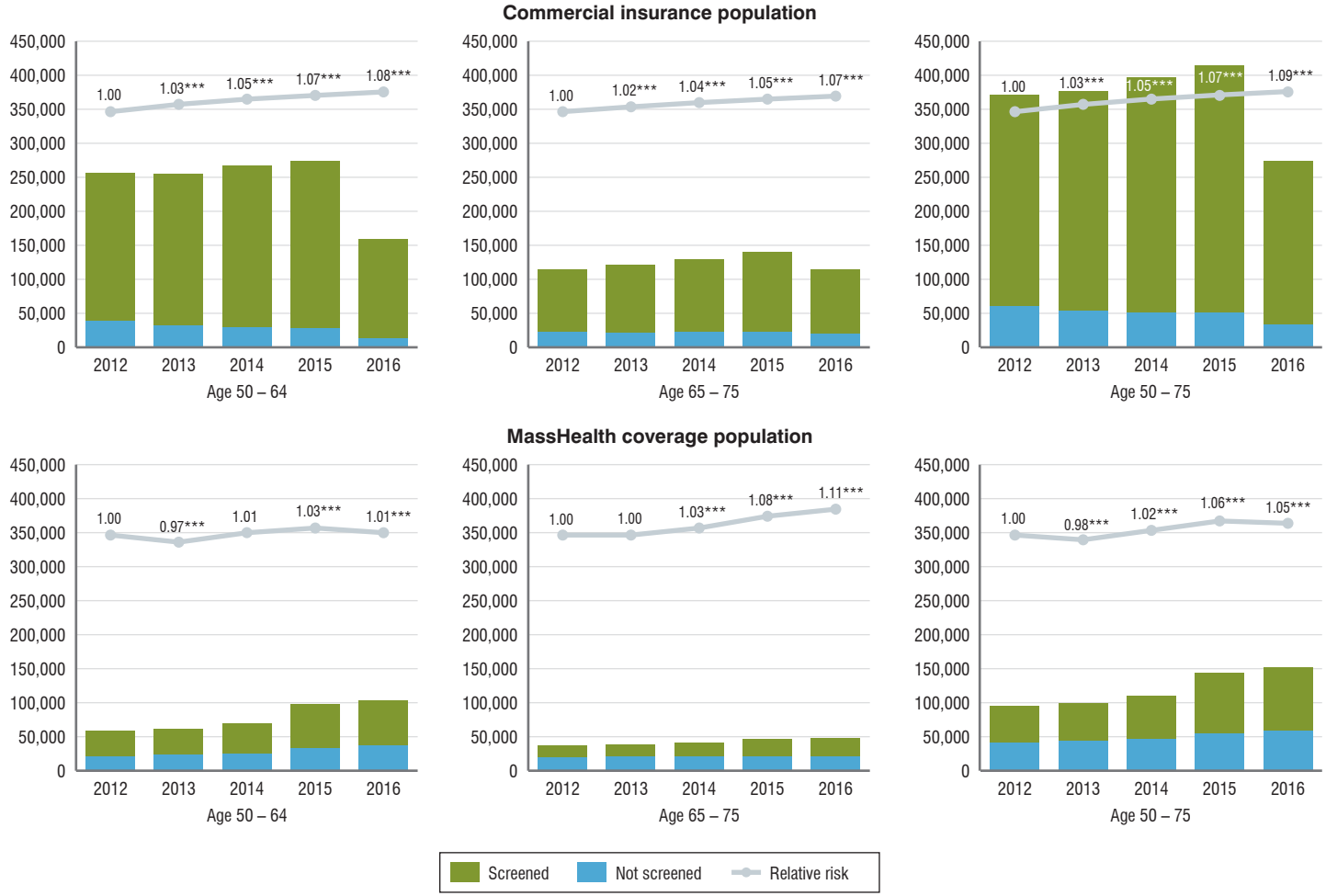


Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Women aged 50-74 with MassHealth were more likely (5%) to have a mammogram in the past 27 months in 2016, compared to 2012. Women aged 65-74 make up most of that increase.

For those with commercial coverage, the 2016 likelihood was 9% higher than in 2012, with similar increases between the two age groups.

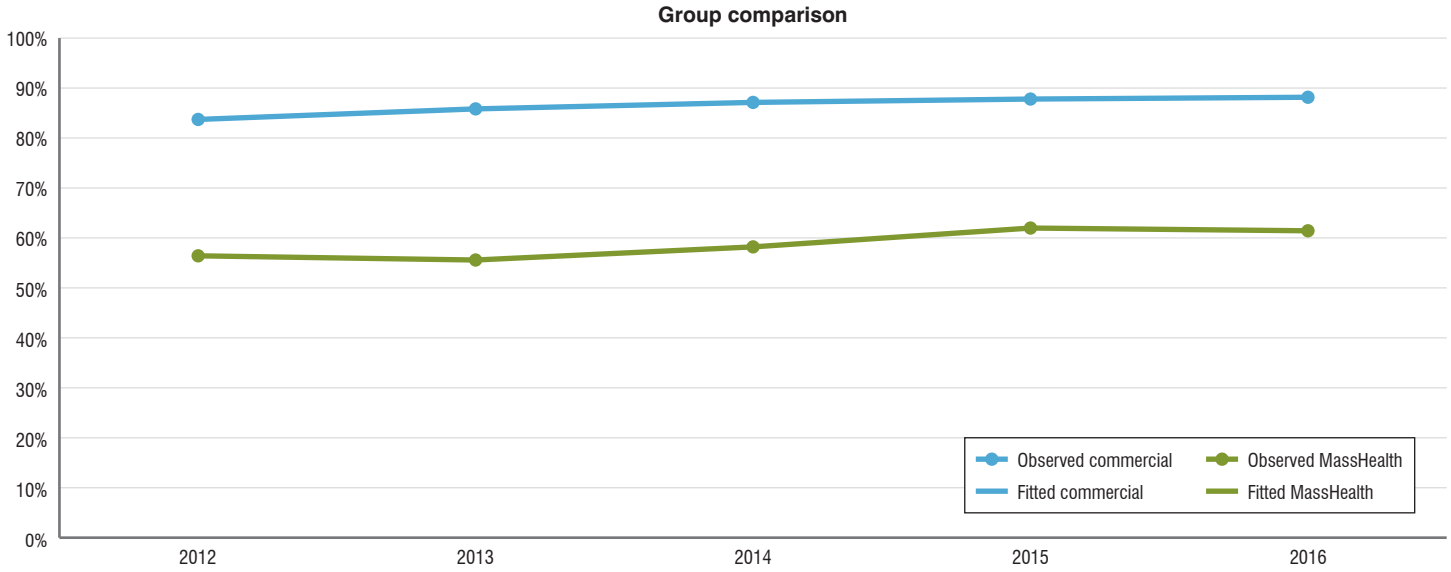
Table 50. Mammogram in past 27 months, women aged 50-74



There was a difference between the rates of mammograms between commercially- and MassHealth-covered women.

There was no reduction in the gap, 2012-2016.

Table 50 (con't). Mammogram in past 27 months, women aged 50-74



Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Neither adults with MassHealth nor those with commercial coverage had a change in imaging performed in the 28 days following a lower back pain diagnosis (2016 compared to 2012).

The difference in appropriate lower back imaging between adults with commercial coverage and those with MassHealth was small but statistically significant.

Table 51. No imaging performed in 28 days following diagnosis of low back pain, adults

Note 1: Statistically significant difference from 2012: *$p<.05$, **$p<.01$, ***$p<.001$.
Note 2: Generalized Estimation Equations are used for this longitudinal data from 2010 to 2016. Different subjects are assumed to be statistically independent, and observations within subjects are assumed to be correlated.
Source: OSA analysis of APCD (commercial insurance) and MassHealth claims data.

Trends in Administrative and DPH Data

The pie charts illustrate the distribution of trends using all the measures from the administrative and DPH data.

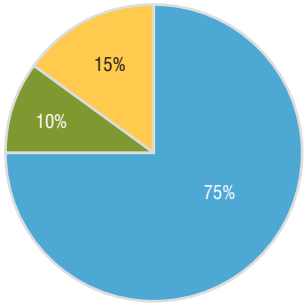
The trends in the administrative data were more positive (75%) than negative (10%) or no change (15%).

In the DPH data, the majority of metrics did not show a change (61%), whereas a negative change (26%) was higher than positive change (13%).

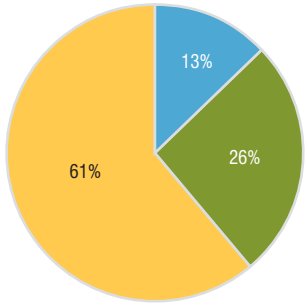
The bar chart shows the ranking in health outcomes by racial/ethnic groups using the DPH data. Whites ranked number 1 in 9 measures, followed by Asians ranking number 1 in 8 measures (Asians had missing data in six measures).

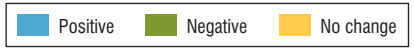
African-Americans and Latinos ranked number 3 or 4 more often than Whites and Asians, illustrating the persistence of health disparities.

Distribution of trends, Commercial and MassHealth



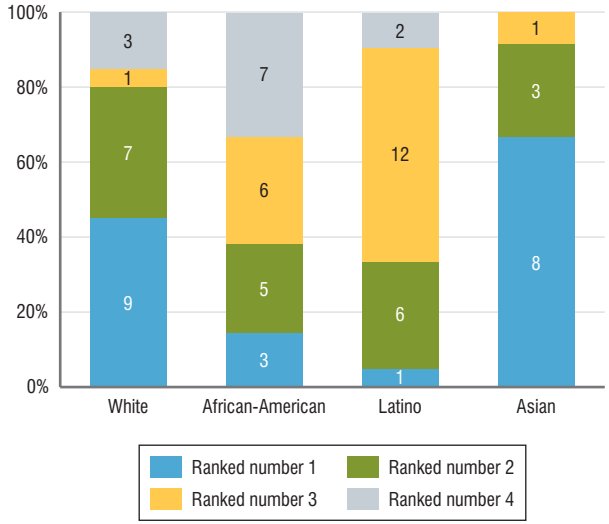
Distribution of significant trends, DPH





Claims data percentages reflect a count of 20 sub-measures (10 from APCD data; 10 from MassHealth data).

Ranking in health outcomes by Race/Ethnicity, DPH



Self-reported data (BRFSS from DPH). Results reflect the rankings by Race/Ethnicity for 21 measures. Asian group had missing data for 6 measures.

Policy Implications

More complete administrative data from claims, as well as improvement in data collection and distribution from DPH, are needed.

Disparities persist between MassHealth members in comparison to commercially insured individuals.

Reducing barriers to access and quality of health services will be key to closing the gap between public and commercially insured individuals.

Self-reported prevention measures (from DPH data) showed a stagnation in terms of progress across the vast majority of the measures.

More spending and focus on prevention, population health, and the social determinants of health are needed.

Latinos, African-Americans, and people with low income represent the largest challenges in terms of health disparities; additional interventions are needed.

Future Directions

As new health care cost containment initiatives are being considered by the Legislature, it will be critical to continue to improve data quality and access so that these new efforts are guided by data and evidence.

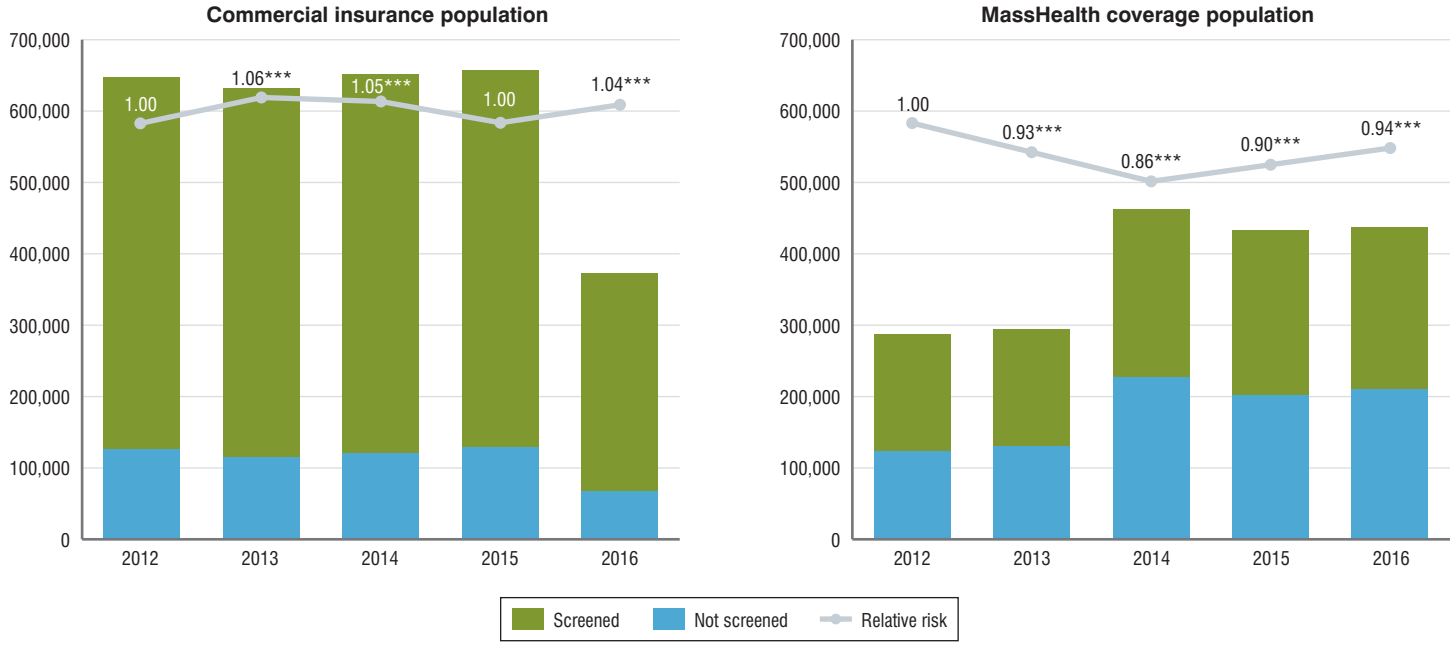
Additionally, as MassHealth reforms progress, special attention should be taken in order to reduce rather than grow the disparities that exist with those covered commercially.

Moreover, it is critical to reverse the neglect of public health interventions. Using a population health framework and targeted efforts to address the social determinants of health have the potential to help the Commonwealth achieve its goal of reducing total health expenditures and addressing health disparities.

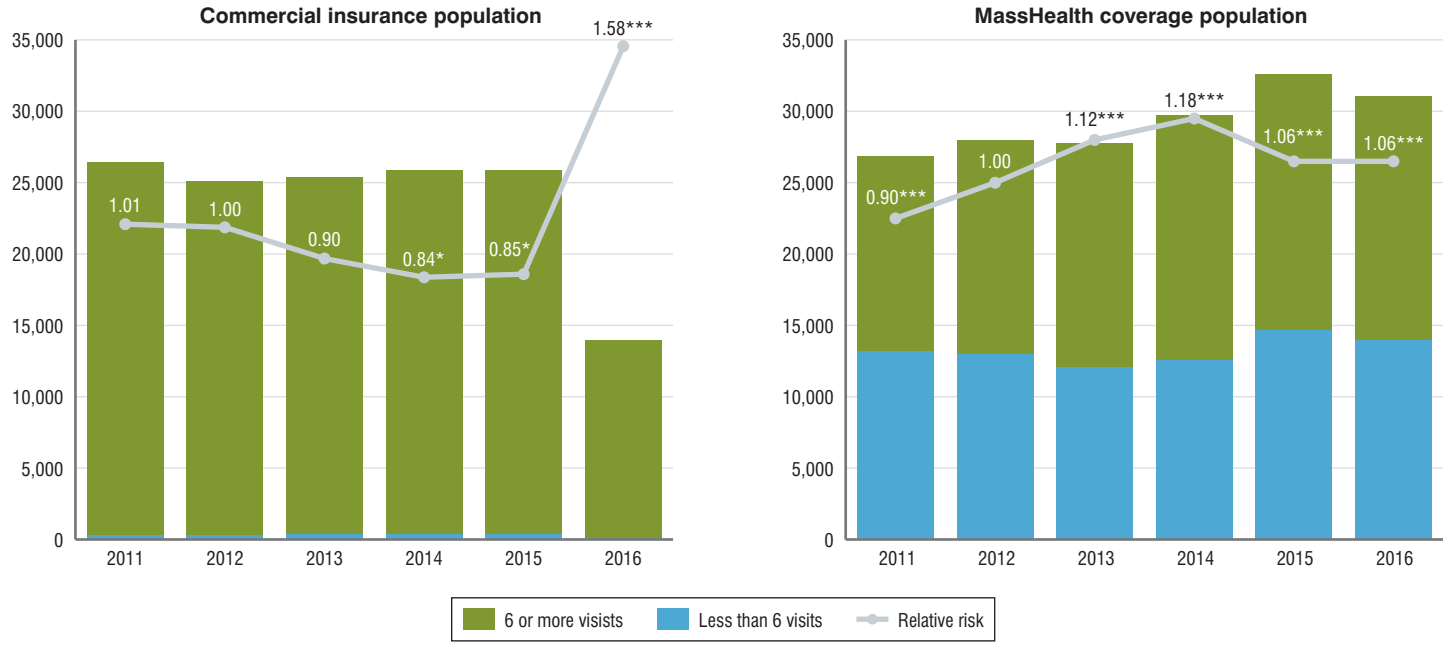
Addendum

APCD6 and MassHealth Odds Ratio Data Analysis

Odds Ratio Table 42. Cervical Cancer Screening, women 24-64



Odds Ratio Table 43. Well-child visits in the first 15 months

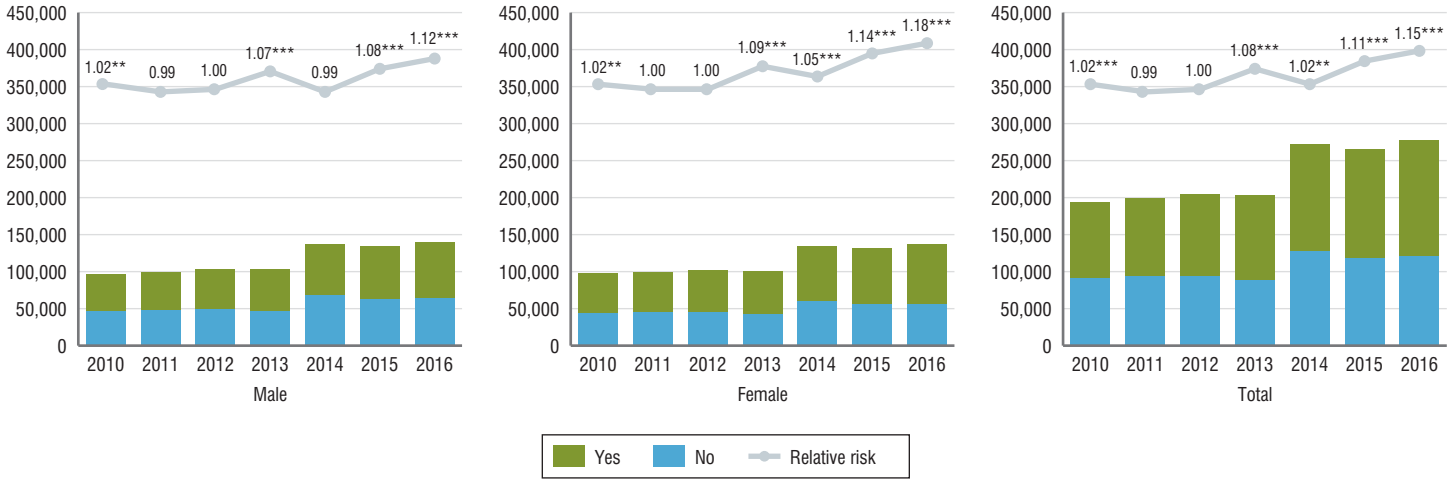


Odds Ratio Table 44. Well-child visits from 3 to 6 years

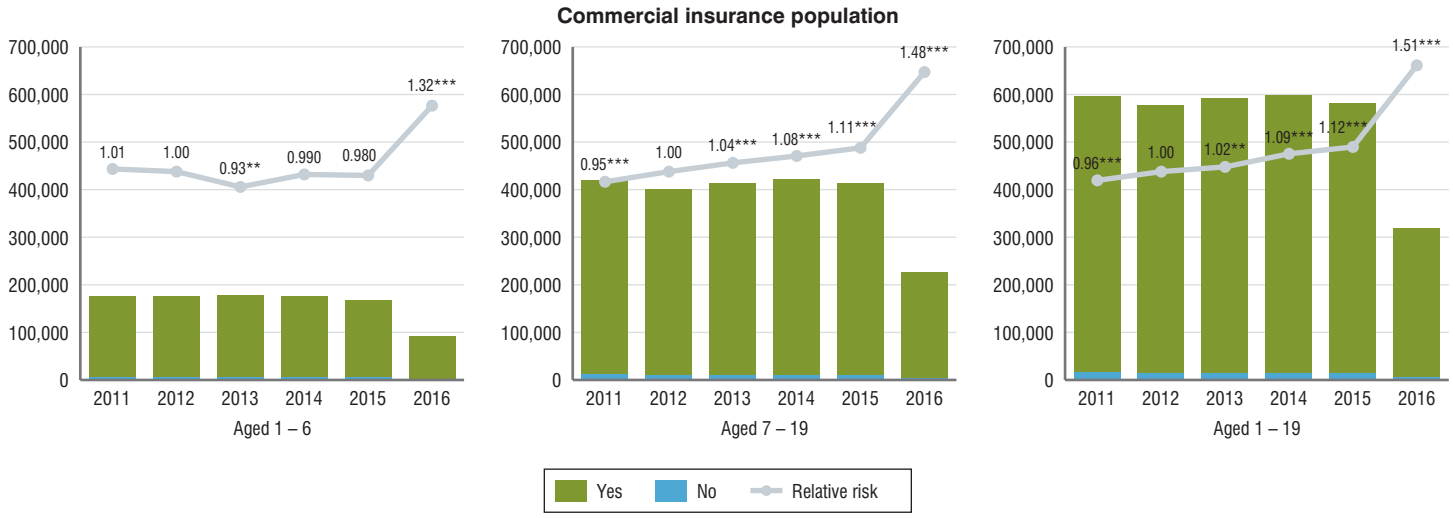
Odds Ratio Table 45. Well-care visits in last year among 12-21 year olds

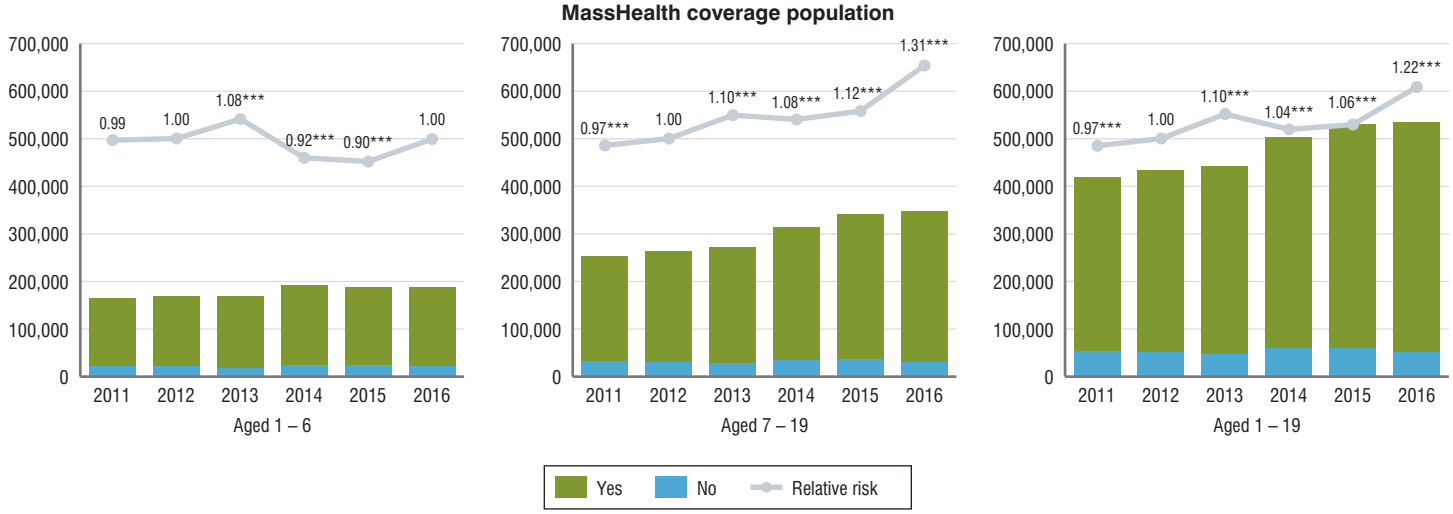
Commercial insurance population

MassHealth coverage population



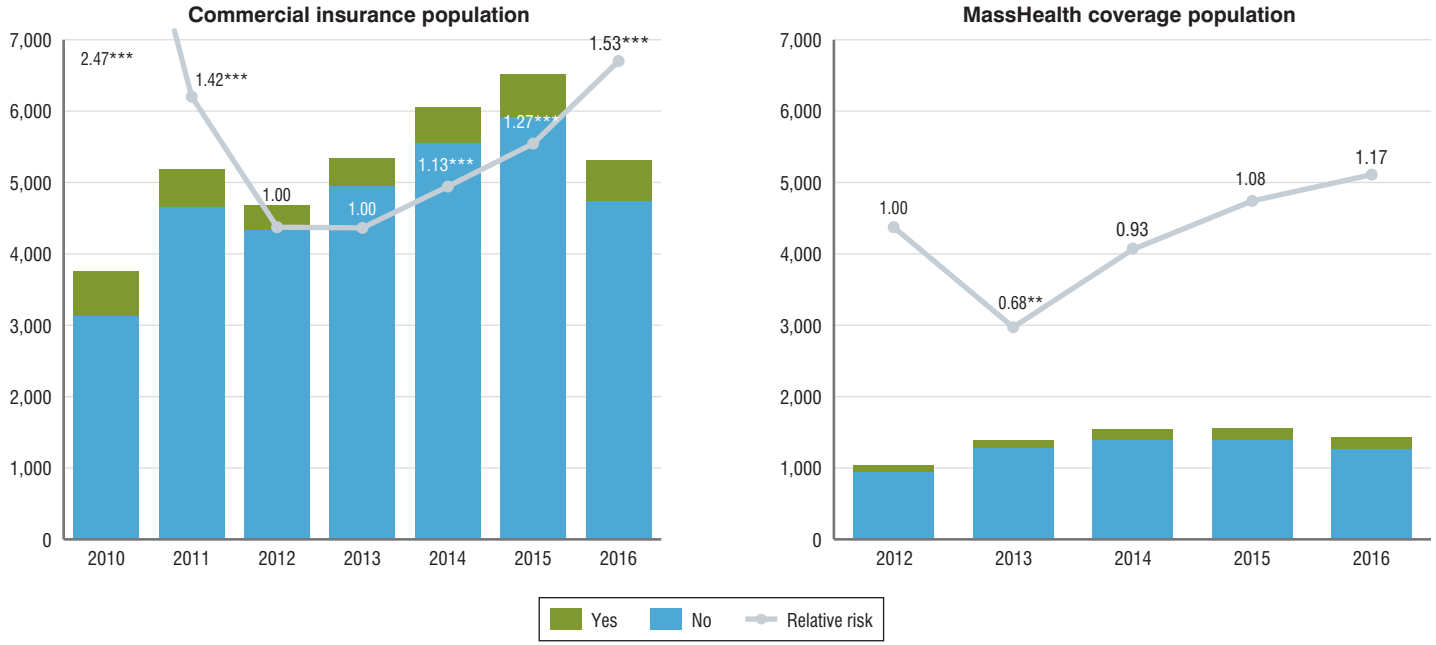
Odds Ratio Table 46. Access to primary care, aged 1-19 years



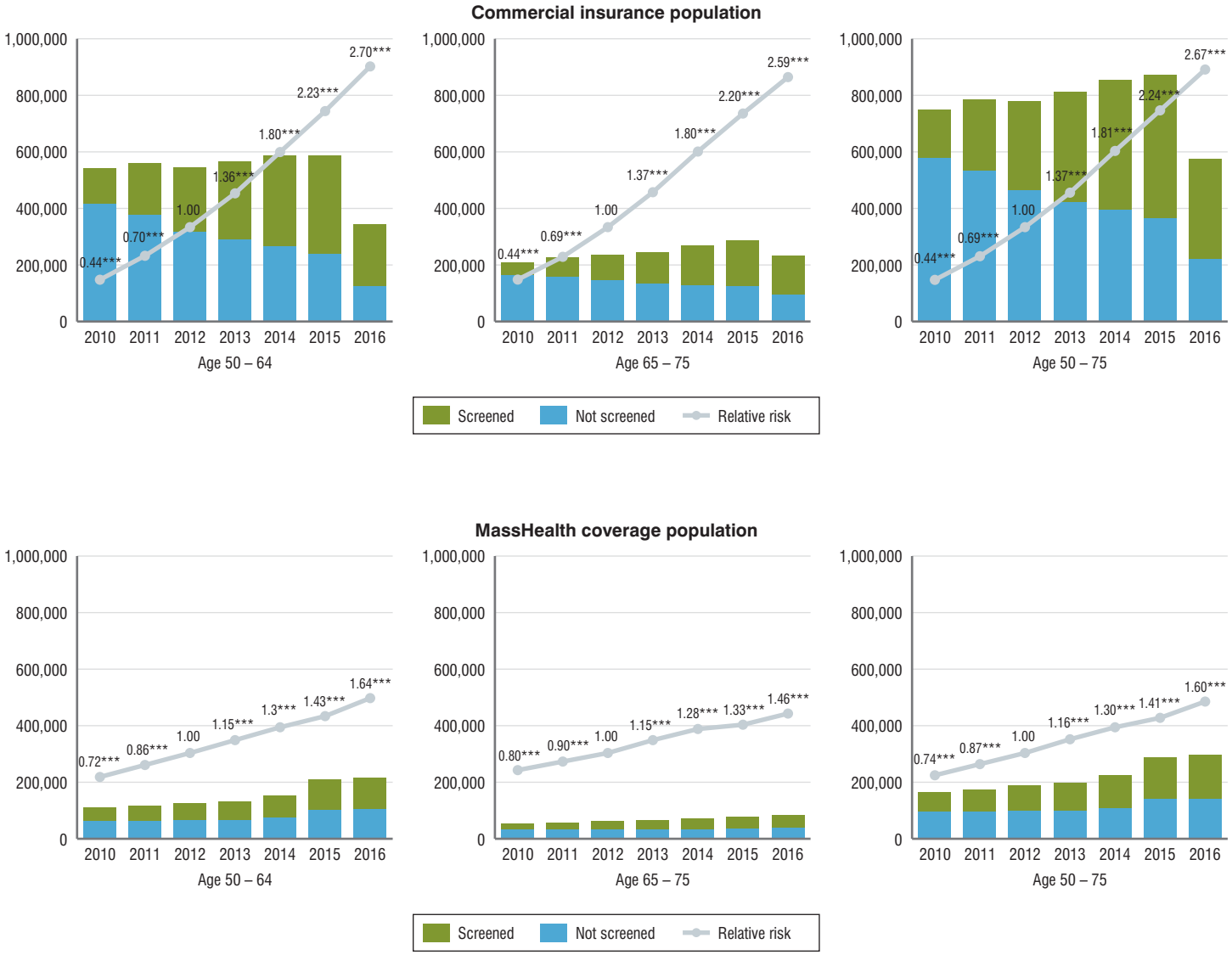


Odds Ratio Table 47. Lead screening in children

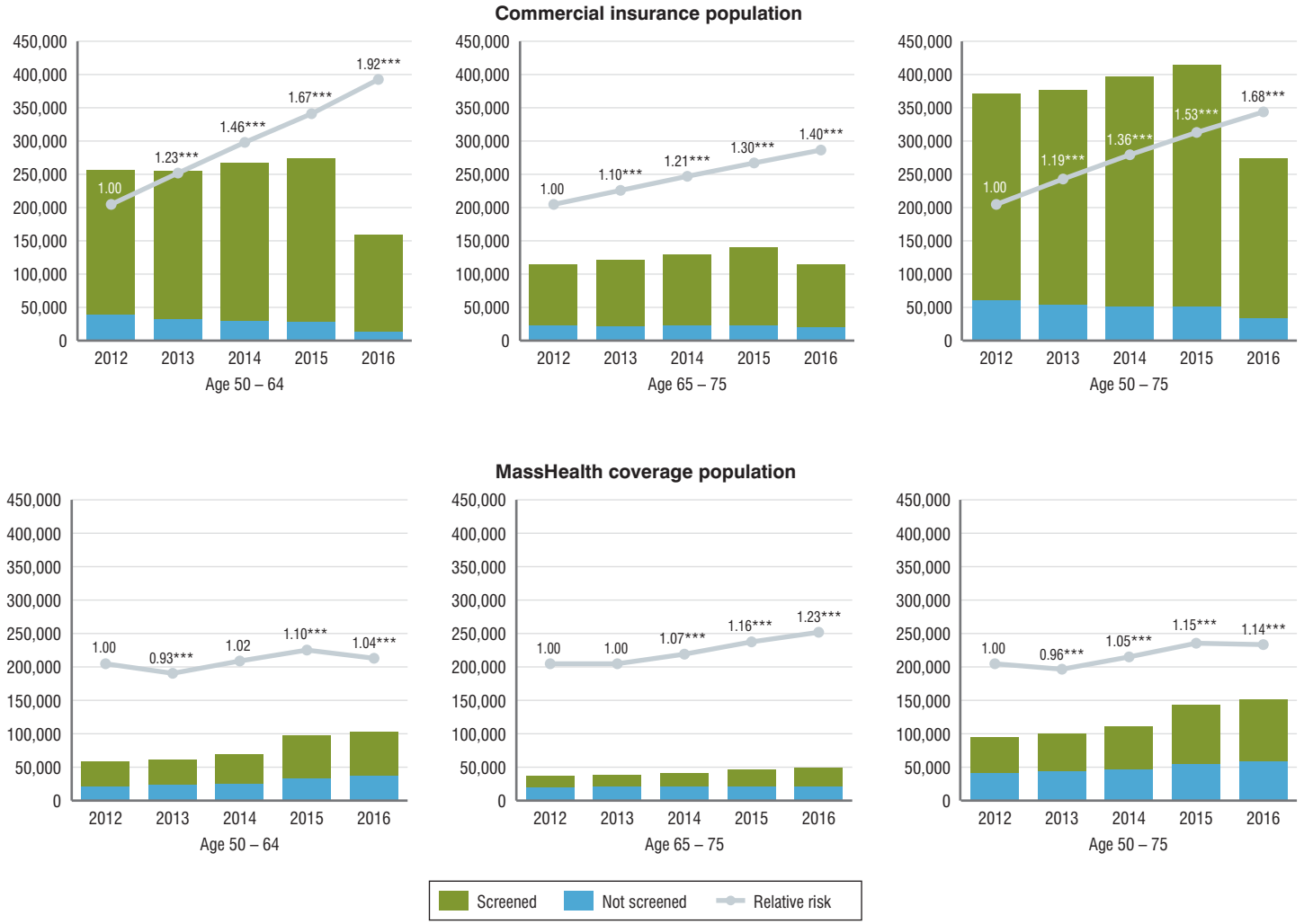
Odds Ratio Table 48. Osteoporosis management post-fracture, women aged 67-85



Odds Ratio Table 49. Colorectal cancer screening



Odds Ratio Table 50. Mammogram in past 27 months, women aged 50-74



Odds Ratio Table 51. No imaging performed in 28 days following diagnosis of low back pain, adults