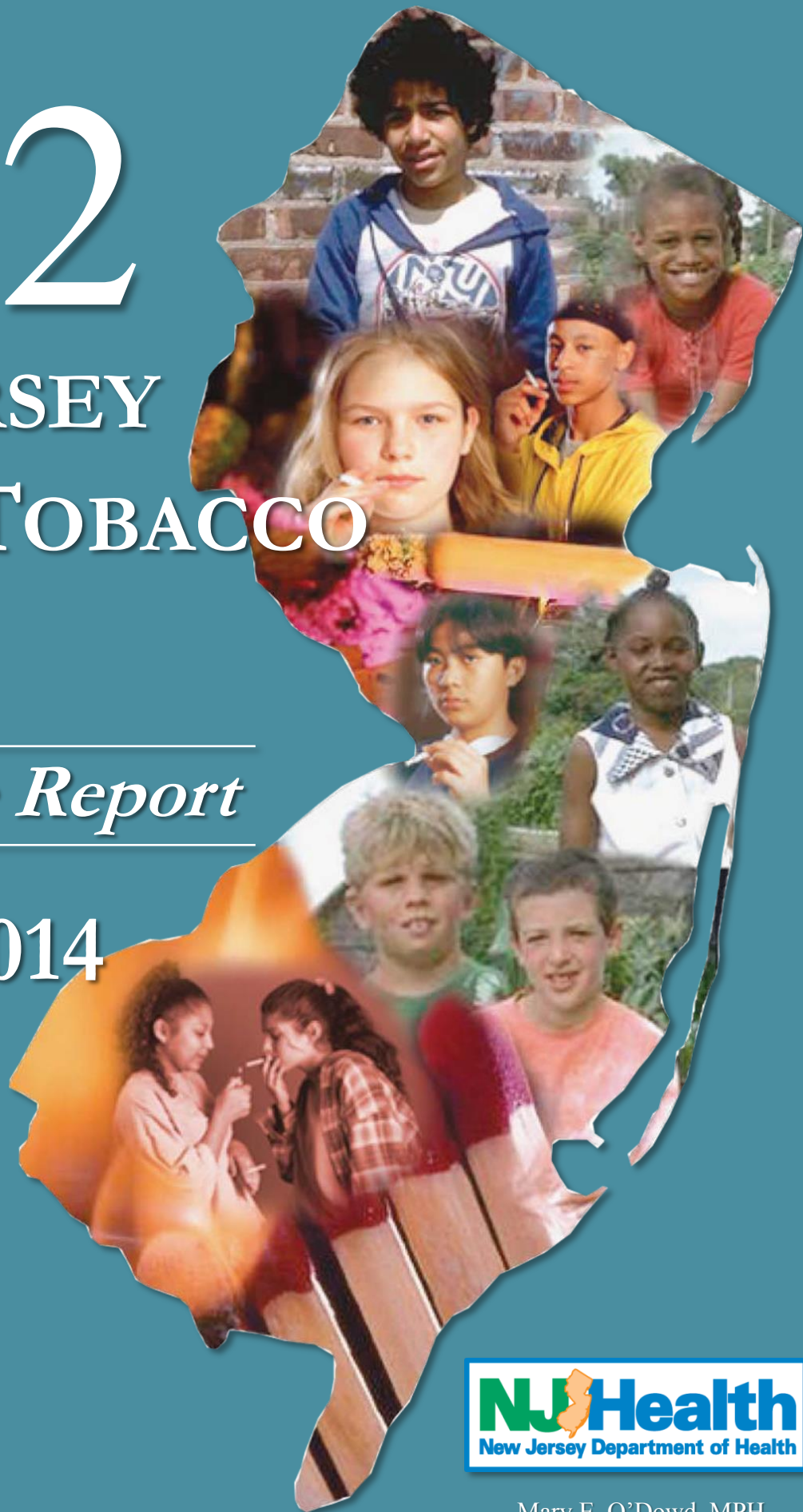


# 2012

## NEW JERSEY YOUTH TOBACCO SURVEY

*A Statewide Report*

### January 2014



Chris Christie, Governor  
Kim Guadagno, Lt. Governor

Mary E. O'Dowd, MPH  
Commissioner

## **ACKNOWLEDGEMENTS**

The New Jersey Office of Tobacco control (OTC) is a unit of the New Jersey Department of Health (DOH) under the direction of Commissioner Mary E. O'Dowd. The OTC is administratively located within the Community Health and Wellness Unit in the Division of Family Health Services. This report was prepared for the DOH by Rutgers, The State University of New Jersey through funding from the DOH. The interpretations of data, conclusions, and recommendations expressed in this report are those of the authors and may not represent the views of the DOH.

### **The 2012 New Jersey Youth Tobacco Survey was completed by**

The Center for Tobacco Studies  
School of Public Health  
Rutgers, The State University of New Jersey

### **NJYTS trainers, recruiters, and field monitors:**

Raina Brown  
Brenda Clark  
Karen Culp  
Joyce Ferris  
Stephanie Richelsen  
Avi Sayag

### **We would like to acknowledge the valuable assistance of the following organizations:**

New Jersey Department of Education  
Office on Smoking and Health, Centers for Disease Control and Prevention  
ICF International

We would also like to thank the superintendents, principals, teachers, parents, and students of the schools who agreed to take part in this survey. Their participation made this research possible and has made a real contribution to youth tobacco control efforts in New Jersey.

### **Suggested Citation**

Davis CM, Delnevo CD, Manderski, MTB, Hrywna M. The 2012 New Jersey Youth Tobacco Survey: A Statewide Report. New Brunswick, NJ: Rutgers-School of Public Health; January 2014.

TABLE OF CONTENTS

**HIGHLIGHTS** .....2

**INTRODUCTION**.....3

**RESULTS** .....4

**Lifetime or Ever Use of Tobacco** .....4

**Current Use of Any Tobacco**.....6

**Current Cigarette Use** .....7

**Current Cigar Use** .....8

**Current Smokeless Tobacco Use** .....8

**Current Bidi Use** .....9

**Current Hookah Use** .....9

**Strategies to Reduce Youth Smoking** ..... 12

**Access and Purchasing of Cigarettes** ..... 12

**Secondhand Smoke** ..... 13

**Youth Empowerment**..... 14

**Smoking Cessation** ..... 14

**CONCLUSIONS** ..... 15

**Overview of Findings** ..... 15

**Limitations** ..... 16

**Recommendations** ..... 17

**TECHNICAL NOTES**..... 18

**GLOSSARY** ..... 19

**REFERENCES** .....20

## HIGHLIGHTS

### The 2012 New Jersey Youth Tobacco Survey found that:

- Overall, lifetime tobacco use among high school students decreased from 2010 to 2012.
- Overall, current tobacco use among high school students decreased significantly from 2010 to 2012.
- 38.7% of high school students reported having ever tried some form of tobacco.
- 9.3% of high school students reported current use of cigarettes - a significant decrease from 2010.
- 8.4% of high school students reported current use of a hookah.
- 6.3% of high school students reported current use of cigars.
- 6.1% of high school students reported current use of e-cigarettes.
- 3.4% of high school students reported current use of smokeless tobacco.
- 3.0% of high school students reported current use of bidis.
- Among high school students under the age of 19 who reported usually obtaining their cigarettes by purchasing them in a store, 63.4% of current smokers reported they were not refused because of age.
- 34.9% of high school students reported awareness of places in New Jersey that sell loose or single cigarettes.
- 28.3% of high school students reported being exposed to secondhand smoke in either rooms or in cars during the seven days preceding the survey.
- Among current high school smokers, 44.5% reported a desire to stop smoking.
- Among frequent high school smokers, 37% had been advised by a health professional not to smoke.

## INTRODUCTION

The New Jersey Comprehensive Tobacco Control Program (CTCP), in existence from 2000 to 2010, sought to decrease deaths, sickness and disability among residents who use tobacco or are exposed to secondhand smoke. In 2011, the former CTCP was modified and renamed to the Office of Tobacco Control (OTC) at the NJ Department of Health. Efforts that remain include: increasing tobacco-free policies in schools; the Tobacco Age of Sale Enforcement (TASE) program, which aims to stop the sale of tobacco to minors; NJQuitline, a telephone counseling service to help youth and adults quit smoking; and, coalition building for the sustainability of the program. OTC continues to move toward activities that are focused on population-based strategies such as broad policy efforts that help the public at large as well as those with chronic diseases. These efforts include reducing exposure to secondhand smoke and access to tobacco.

New Jersey began statewide youth tobacco surveillance in 1999 using the Youth Tobacco Survey. The Centers for Disease Control and Prevention (CDC) developed the National Youth Tobacco Survey (NYTS) to provide states with data, such as population-based estimates of the prevalence of tobacco use among middle and high school students to support the design, implementation, and evaluation of comprehensive tobacco control programs. The New Jersey Youth Tobacco Survey (NJYTS) is an adaptation of the NYTS and includes state-added questions specific to programming and youth tobacco use trends in New Jersey. The first NJYTS was intended to provide a baseline for monitoring progress toward the CTCP's goal to reduce tobacco use among youth. After the baseline survey, the NJYTS was repeated in 2001, 2004, 2006, 2008, 2010 and 2012. While previous survey administrations included both middle and high school students, the 2010 and 2012 NJYTS included high schools only.

The 2012 NJYTS was administered to 1,864 high school students (grades 9-12) in 27 schools during the fall of 2012, of which 1,850 completed usable questionnaires. The devastating, statewide effects of Superstorm Sandy at the end of October postponed survey administration at some schools, and caused other schools to cancel participation altogether (see Technical Notes, page 18). However, the findings of the 2012 NJYTS are representative of all 9<sup>th</sup> through 12<sup>th</sup> grade public school students. The *2012 New Jersey Youth Tobacco Survey: A Statewide Report* summarizes current tobacco use patterns among New Jersey youth using results from the most recent NJYTS administration. These results are compared with data collected from previous NJYTS administrations as well as national trends.

## RESULTS

## Lifetime or Ever Use of Tobacco

New Jersey high school students were asked if they had ever used cigarettes, cigars, smokeless tobacco (SLT), bidis, or hookahs in their lifetime. In 2012, questions regarding use, or ever use, of e-cigarettes and snus, two emerging, popular tobacco products, were also included in the NJYTS. Lifetime or ever use is defined as trying a tobacco product even one time. However, hookah, e-cigarette, and snus use were excluded from the lifetime or ever use of any tobacco product definition to allow for comparison of prevalence from year to year. Estimates of lifetime or ever use of any and each tobacco product(s) by gender, race/ethnicity, and grade are found in Table 1.

**Table 1. Percentage of New Jersey high school students who ever used any tobacco product\* (cigarettes, cigars, smokeless tobacco, and/or bidis) by gender, race/ethnicity, and school grade—New Jersey Youth Tobacco Survey, 2012**

	Any* % ± CI	Cigarette % ± CI	Cigar % ± CI	SLT† % ± CI	Bidis % ± CI	Hookah % ± CI	E-Cig % ± CI	Snus % ± CI
<b>Gender</b>								
Male	43.8 ±5.0	33.1 ±6.3	28.4 ±3.6	14.6 ±2.9	8.0 ±3.0	19.2 ±2.8	16.3 ±4.3	7.4 ±2.0
Female	33.5 ±4.4	26.9 ±4.1	15.3 ±2.5	4.6 ±1.5	6.3 ±1.9	17.7 ±4.2	9.9 ±2.6	2.4 ±0.7
<b>Race/Ethnicity</b>								
White	37.2 ±5.4	27.0 ±5.8	25.3 ±3.3	11.9 ±2.6	5.8 ±2.4	18.1 ±3.4	14.6 ±3.9	5.0 ±1.7
Black	38.0 ±8.5	28.4 ±6.8	17.5 ±5.8	6.5 ±3.5	8.2 ±4.4	13.0 ±5.3	8.1 ±3.3	6.1 ±3.7
Hispanic	47.3 ±4.5	41.7 ±4.7	19.8 ±4.5	6.6 ±2.7	9.8 ±3.3	25.7 ±4.8	14.5 ±3.5	4.4 ±2.2
<b>Grade</b>								
9	28.1 ±6.0	20.0 ±6.4	13.0 ±2.9	6.3 ±2.6	7.2 ±2.9	9.4 ±2.6	9.6 ±4.5	2.6 ±1.4
10	35.8 ±5.5	26.8 ±6.6	18.0 ±3.5	7.4 ±1.7	6.3 ±3.1	14.3 ±5.6	10.9 ±3.2	4.5 ±2.0
11	37.4 ±5.2	29.6 ±6.2	23.1 ±3.4	10.9 ±3.8	7.2 ±2.9	22.1 ±3.7	12.4 ±2.4	5.4 ±2.7
12	54.2 ±4.1	44.3 ±5.5	34.1 ±7.1	14.4 ±3.5	9.7 ±1.7	28.8 ±5.6	20.2 ±6.0	7.4 ±1.6
<b>Overall</b>	<b>38.7 ±4.2</b>	<b>30.0 ±4.7</b>	<b>21.9 ±2.7</b>	<b>9.8 ±1.7</b>	<b>7.3 ±2.2</b>	<b>18.5 ±3.1</b>	<b>13.2 ±2.7</b>	<b>5.0 ±1.1</b>

\*Ever use of cigarettes and/or cigars and/or smokeless tobacco and/or bidis (excludes hookah, e-cigarettes and snus)

†Smokeless tobacco

CI: 95% Confidence Interval

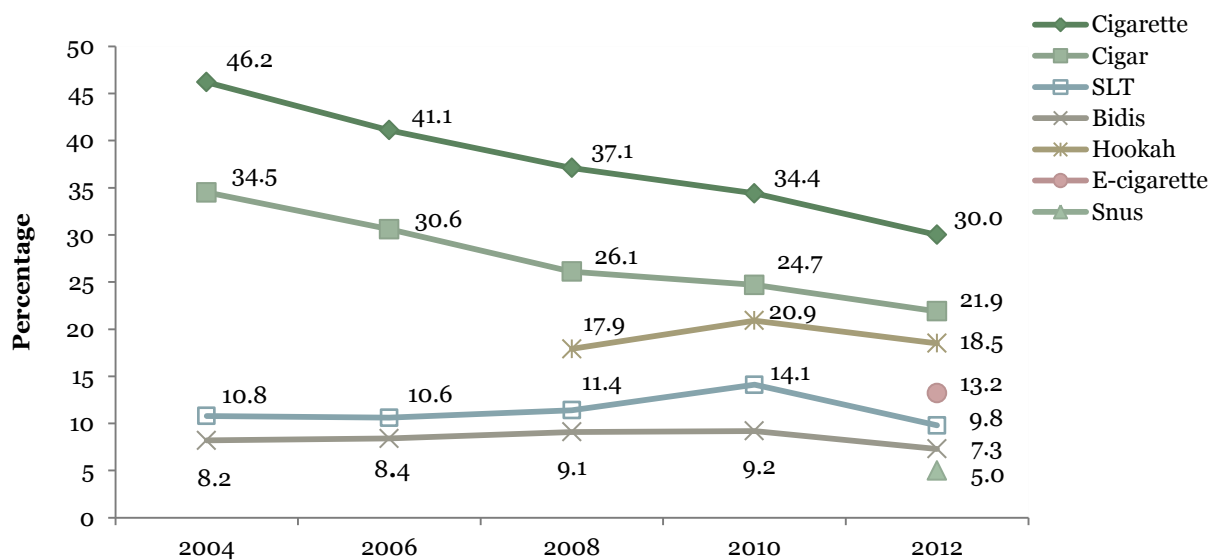
In 2012, 38.7% (±4.2) of high school students reported ever having used any form of tobacco in their lifetime. There were some differences in overall lifetime tobacco use among New Jersey youth by demographic characteristics (see Table 1). Prevalence of lifetime “any” tobacco use was significantly higher for males than females (43.8 ±5.0% vs. 33.5 ±4.4%) and increased with grade level. Specifically, ever use was significantly higher among 12<sup>th</sup> graders (54.2 ±4.1%) compared to 9<sup>th</sup> (28.1 ±6.0%), 10<sup>th</sup> (35.8 ±5.5%) and 11<sup>th</sup> (37.4 ±5.2%) graders, who did not differ from each other. Additionally, ever use of any tobacco type was significantly higher for Hispanic (47.3 ±4.5%) high school students compared to white high school students (37.2 ±5.4%).

Lifetime use of specific tobacco products also differed by demographic characteristics in 2012. Generally, ever use of each tobacco product increased as grade level increased. Twelfth-graders were significantly more likely to report lifetime use of cigarettes and cigars than 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> graders and significantly more likely than 9<sup>th</sup> and 10<sup>th</sup> graders for SLT and hookah lifetime use. In addition, 12<sup>th</sup> graders were significantly more likely to report higher ever use of snus than 9<sup>th</sup> graders. Males were significantly more likely than females to report lifetime use of cigars (28.4 ±3.6% vs. 15.3 ±2.5%), SLT (14.6 ±2.9% vs. 4.6 ±1.5%), and snus (7.4 ±2.0% vs. 2.4 ±0.7%) but there were no significant differences in reported lifetime use of cigarettes, bidis, hookah, and e-cigarettes by gender.

The prevalence of lifetime use of cigarettes was higher for Hispanics than whites or blacks (41.7 ±4.1% vs. 27.0 ±5.8% and 28.4 ±6.8%, respectively). Hispanic students also reported significantly higher lifetime hookah use than black students (25.7 ±4.8% vs. 13.0 ±5.3%). There were, however, no significant differences in prevalence of ever cigar, SLT, bidis, e-cigarettes, or snus use by race/ethnicity.

The overall prevalence of lifetime any tobacco use among high school students has decreased steadily over time, and this difference is significant when comparing 2012 (38.7 ±4.2%) to 2008 (48.7 ±3.4%) and earlier. Cigarettes and cigars remained the most frequently used tobacco products by NJ high school students, although prevalence of lifetime use of these products has decreased over time. In 2012, the first and significant decrease in lifetime smokeless tobacco (SLT) use was reported along with the first decreases in lifetime prevalence of bidis and hookah use (Figure 1).

**Figure 1: Prevalence of lifetime tobacco use among all high school students, by type of tobacco product – NJYTS 2004 - 2012**



### Current Use of Tobacco

Current tobacco use is defined as the use of any tobacco product on one or more days in the 30 days preceding the survey. This measure includes experimenters (those who may have just tried their first cigarette), occasional users (those who smoke occasionally) and regular smokers. New Jersey youth were asked about their current use of cigarettes, cigars, smokeless tobacco, bidis, hookah, e-cigarettes, and snus (although hookah, e-cigarettes, and snus were excluded from the definition of current use of any tobacco product). Current use of all tobacco products by gender, race/ethnicity, and grade is found in Table 2.

#### Current Use of Any Tobacco

Overall, 13.6% ( $\pm 2.6$ ) of high school students reported using some form of tobacco (i.e., cigarettes, cigars, smokeless tobacco, or bidis) in the 30 days preceding the survey. This was a significant decrease from 2010 when the overall rate of current any tobacco use was 22.2% ( $\pm 2.2$ ). There were demographic differences in overall rate of current any tobacco use among New Jersey youth in 2012 (see Table 2). As in previous years, 12<sup>th</sup> graders (20.6  $\pm$  5.6%) and 10<sup>th</sup> graders (11.6  $\pm$  3.1%) were significantly more likely than 9<sup>th</sup> graders (7.4  $\pm$  2.5%) to report current tobacco use. In addition, in 2012, 12<sup>th</sup> graders were significantly more likely to report current tobacco use than 10<sup>th</sup> graders. As in 2010, there were no significant differences in prevalence of current tobacco use by race/ethnicity, or gender. However, estimates of current tobacco use decreased significantly for male, female, white, 9<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> grade students from 2010 to 2012.

**Table 2. Percentage of New Jersey high school students who were current users of any tobacco product\* (cigarettes, cigars, smokeless tobacco, and/or bidis) by gender, race/ethnicity, and school grade—New Jersey Youth Tobacco Survey, 2012**

	Any*		Cigarette		Cigar		SLT <sup>†</sup>		Bidis		Hookah		E-cig		Snus	
	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI	%	$\pm$ CI
<b>Gender</b>																
Male	16.2	$\pm 3.9$	10.3	$\pm 3.3$	8.6	$\pm 2.1$	5.6	$\pm 2.2$	3.7	$\pm 1.7$	8.1	$\pm 2.4$	7.8	$\pm 2.5$	2.9	$\pm 0.8$
Female	10.8	$\pm 2.5$	8.2	$\pm 2.0$	4.0	$\pm 1.8$	1.0	$\pm 0.6$	2.1	$\pm 1.3$	8.4	$\pm 2.6$	4.3	$\pm 1.1$	1.4	$\pm 1.0$
<b>Race/Ethnicity</b>																
White	14.4	$\pm 3.8$	9.8	$\pm 3.5$	7.1	$\pm 2.1$	4.2	$\pm 1.6$	2.0	$\pm 1.1$	6.0	$\pm 1.6$	6.4	$\pm 2.2$	1.4	$\pm 0.9$
Black	10.6	$\pm 3.5$	5.2	$\pm 2.5$	5.7	$\pm 2.6$	2.5	$\pm 2.1$	4.4	$\pm 3.8$	8.5	$\pm 4.4$	3.7	$\pm 2.6$	4.0	$\pm 2.6$
Hispanic	16.5	$\pm 3.1$	12.5	$\pm 2.7$	5.5	$\pm 1.8$	2.5	$\pm 1.4$	4.1	$\pm 1.4$	15.8	$\pm 3.7$	7.7	$\pm 2.5$	3.4	$\pm 1.7$
<b>Grade</b>																
9	7.4	$\pm 2.5$	5.2	$\pm 2.4$	3.0	$\pm 1.0$	1.7	$\pm 1.2$	2.6	$\pm 1.6$	5.4	$\pm 1.9$	5.9	$\pm 2.2$	2.2	$\pm 1.7$
10	11.6	$\pm 3.1$	7.5	$\pm 2.9$	4.1	$\pm 1.7$	3.4	$\pm 1.0$	2.9	$\pm 2.0$	8.1	$\pm 4.0$	4.8	$\pm 2.0$	3.4	$\pm 1.9$
11	15.1	$\pm 3.5$	9.4	$\pm 3.1$	8.7	$\pm 3.1$	4.0	$\pm 2.3$	3.0	$\pm 2.2$	12.3	$\pm 3.4$	5.0	$\pm 2.0$	1.3	$\pm 0.9$
12	20.6	$\pm 5.6$	15.3	$\pm 5.4$	9.7	$\pm 3.0$	4.5	$\pm 2.3$	3.1	$\pm 1.1$	7.6	$\pm 2.7$	8.5	$\pm 3.9$	1.6	$\pm 1.1$
<b>Overall</b>	<b>13.6</b>	<b><math>\pm 2.6</math></b>	<b>9.3</b>	<b><math>\pm 2.4</math></b>	<b>6.3</b>	<b><math>\pm 1.3</math></b>	<b>3.4</b>	<b><math>\pm 1.1</math></b>	<b>3.0</b>	<b><math>\pm 1.4</math></b>	<b>8.4</b>	<b><math>\pm 1.8</math></b>	<b>6.1</b>	<b><math>\pm 1.5</math></b>	<b>2.3</b>	<b><math>\pm 0.8</math></b>

\*Use of any tobacco (cigarettes, cigars, smokeless tobacco, or bidis) during  $\geq 1$  of the 30 days preceding the survey (excludes hookah, e-cigarettes, and snus)

<sup>†</sup>Smokeless tobacco

CI: 95% Confidence Interval

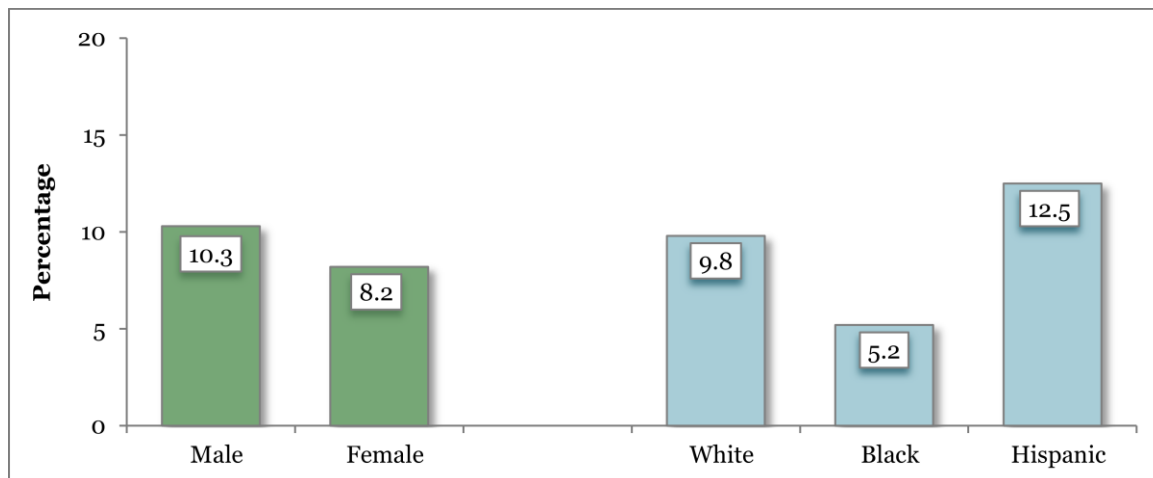


**Current Cigarette Use**

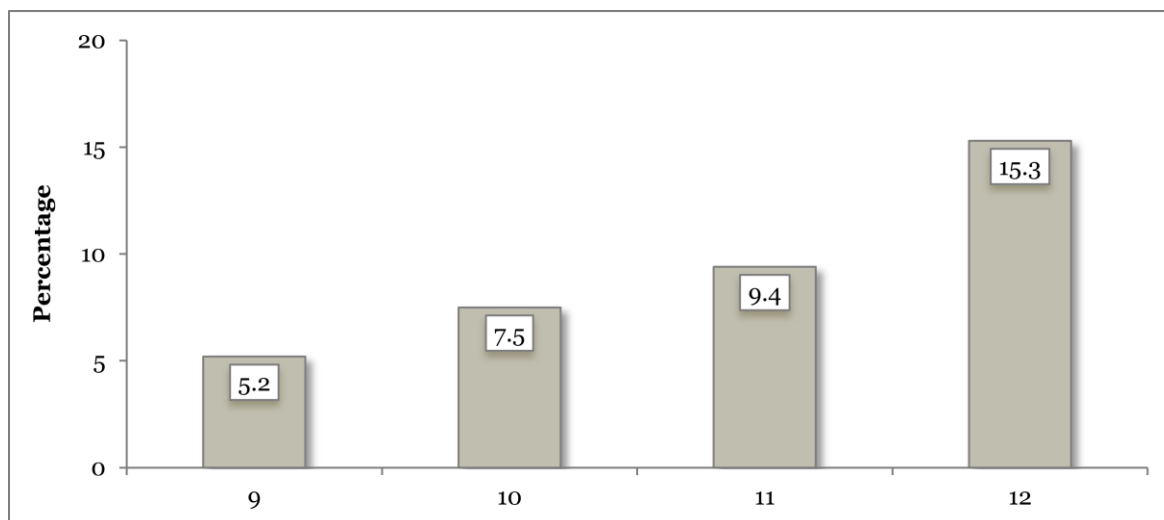
Overall, 9.3% ( $\pm 2.4$ ) of high school students reported smoking a cigarette on one or more days in the 30 days preceding the survey—a significant decrease from 2010 (14.3  $\pm 1.9$ %). Among New Jersey high school students in 2012, current cigarette use was lower across all demographic categories when compared to 2010, and significantly lower for females (8.2  $\pm 2.0$ % in 2012 vs. 14.7  $\pm 2.5$ % in 2010) and 10<sup>th</sup> grade students (7.5  $\pm 2.9$ % in 2012 vs. 14.7  $\pm 3.4$ % in 2010).

In addition, male students were significantly more likely to report current cigarette use than female students (10.3  $\pm 3.3$ % vs. 8.2  $\pm 2.0$ %). Hispanic students reported the highest current cigarette use (12.5  $\pm 2.7$ %) which was significantly higher than current cigarette use reported by Black students (5.2  $\pm 2.5$ %). Prevalence for current cigarette use increased by grade level and 12<sup>th</sup> graders reported significantly higher rates than 9<sup>th</sup> graders (15.3  $\pm 5.4$ % vs. 5.2  $\pm 2.4$ %).

**Figure 2a: Prevalence of current cigarette use among all high school students by gender and race/ethnicity group – NJYTS 2012**



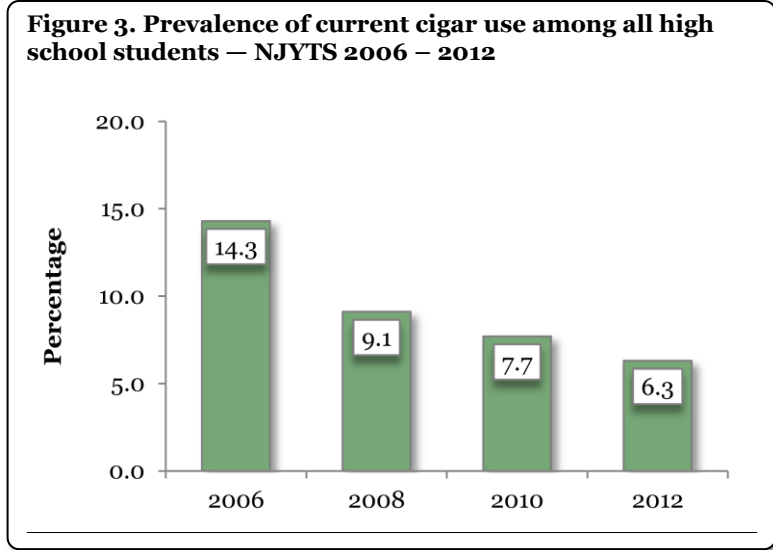
**Figure 2b: Prevalence of current cigarette use among all high school students by grade level – NJYTS 2012**



### Current Cigar Use

In 2012, 6.3% ( $\pm 1.3$ ) of high school students reported smoking a cigar in the past 30 days preceding the survey. Although 2012 prevalence was statistically similar to that in 2010 (7.7  $\pm 1.0$ %), the current estimates represent a significant decrease from 9.1% ( $\pm 1.4$ ) in 2008 (Figure 3) and earlier. There were demographic differences in current cigar use among New Jersey youth in 2012. Among high school students, males (8.6  $\pm 2.1$ %) demonstrated a significantly higher prevalence of current cigar use compared to females (4.0  $\pm 1.8$ %; Figure 4). Additionally, 12<sup>th</sup> graders (9.7  $\pm 3.0$ %) were more than twice as likely as 9<sup>th</sup> graders (3.0  $\pm 1.0$ %) and 10<sup>th</sup> graders (4.1  $\pm 1.7$ %) to report current cigar use. There were no significant

**Figure 3. Prevalence of current cigar use among all high school students – NJYTS 2006 – 2012**



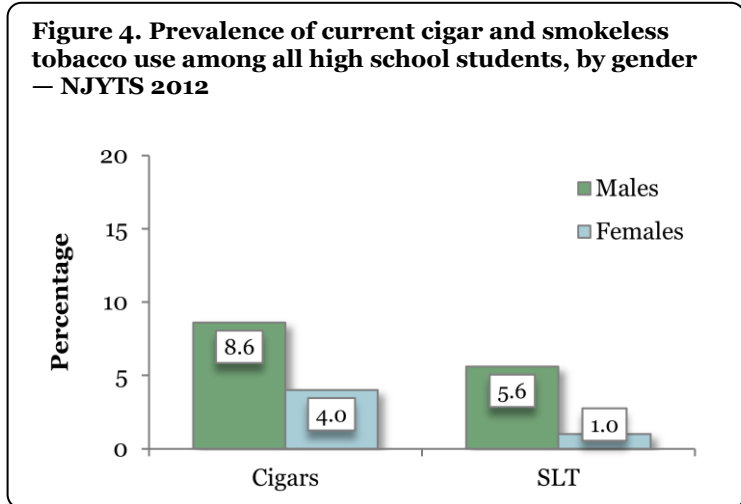
differences in current cigar use by race/ethnicity.

In the 2012 NJYTS students also were asked if the cigars they smoked were flavored (i.e., menthol/mint, fruit, alcohol/wine, or sweet candy-like flavor). Among high school students who are current cigar smokers, 74% ( $\pm 13.3$ ) smoked flavored cigars, with 9<sup>th</sup> graders reporting the highest current use at 92.0%.

### Current Smokeless Tobacco Use

Overall, 3.4% ( $\pm 1.1$ ) of high school students reported using smokeless tobacco in the 30 days preceding the survey. As in previous years, the prevalence of smokeless tobacco use in 2012 was significantly higher among high school males (5.6  $\pm 2.2$ %) compared to females (1.0  $\pm 0.6$ %) (Figure 4). Smokeless tobacco prevalence was also more than twice as high among 10<sup>th</sup> (6.6  $\pm 1.9$ %), 11<sup>th</sup> (6.9  $\pm 3.3$ %) and 12<sup>th</sup> (5.7  $\pm 1.0$ %) graders than among 9<sup>th</sup> graders (2.3  $\pm 1.0$ %). After a slight increase in SLT prevalence in 2010, current SLT use decreased in 2012, overall, as well as across all demographic categories.

**Figure 4. Prevalence of current cigar and smokeless tobacco use among all high school students, by gender – NJYTS 2012**

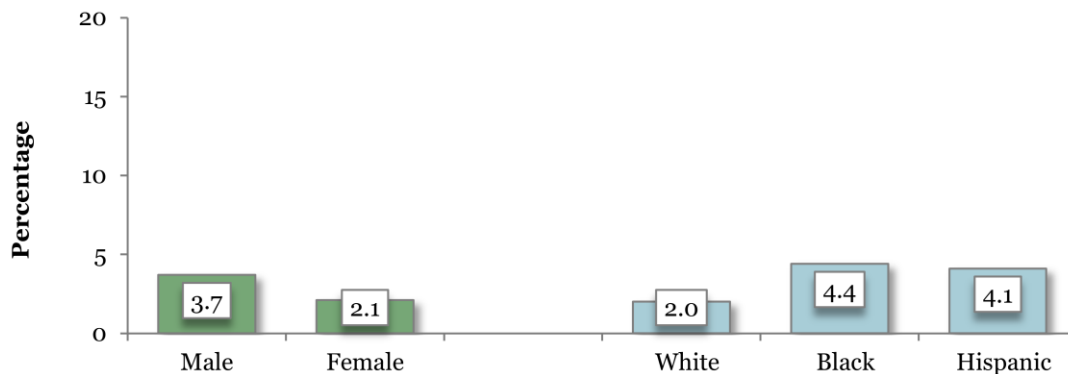


In 2012, high school students who reported using SLT in the previous 30 days also were asked if the smokeless tobacco they used was regular or flavored (mint/wintergreen, fruit, or other). Among those students who were current SLT users, 91.1% ( $\pm 7.0$ ) reported using flavored SLT: 57% of current SLT users used mint/wintergreen, 25% fruit flavored, and 18% some other flavor.

### Current Bidi Use

Bidis are small hand-rolled cigarettes that are often flavored and primarily made in India. In 2012, 3.0% ( $\pm 1.4$ ) of high school students reported smoking bidis in the previous 30 days. There were no statistical differences in bidi use by demographic subgroup. However, there were significant decreases in current bidi use overall and across most demographic categories when comparing 2012 to 2010. Bidi use decreased by at least half and significantly for both males and females, as well as for white and Hispanic students. Despite the three-fold drop in current use for Black students, this decrease was not statistically significant (Figure 5). All grade levels except for 9<sup>th</sup> grade students also reported significant decreases in current bidi use from 2010 to 2012.

**Figure 5: Prevalence of current use of bidis among all high school students, by gender and race/ethnicity group – NJYTS 2012**



### Current Hookah Use

Among high school students, 8.4% ( $\pm 1.8$ ) reported current use of a hookah to smoke tobacco or flavored tobacco, a non-significant decrease from 11.4% ( $\pm 1.6$ ) in 2010. Hookah was the second most popular form of tobacco use, although there were no significant differences among prevalence of current cigarette or cigar use and hookah use (Figure 6). These non-significant differences were observed across demographic groups as well.

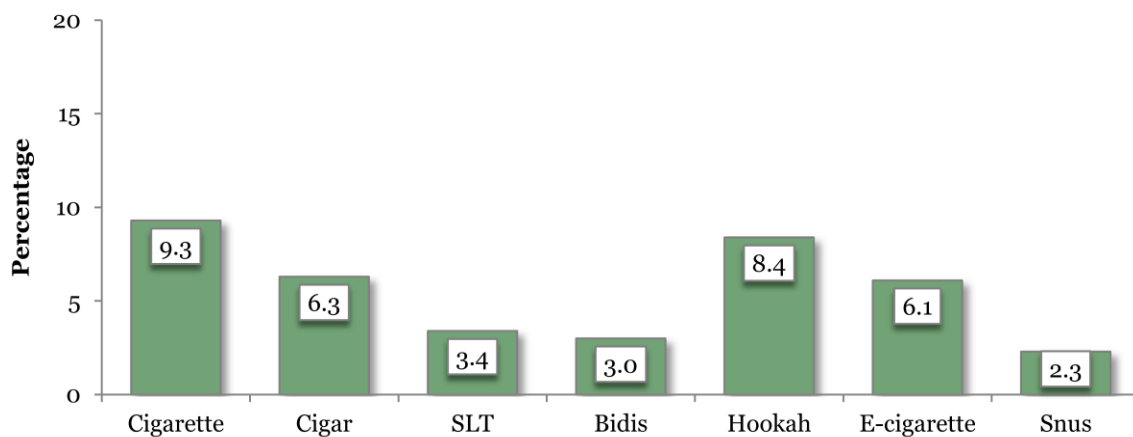
### Current E-Cigarette Use

E-cigarettes, or electronic cigarettes, also referred to as electronic vaping devices, personal vaporizers, or electronic nicotine delivery systems (ENDS) are battery-powered devices which simulate tobacco smoking. The e-cigarette consists of a heating element that vaporizes a liquid solution which contains a mixture of nicotine and flavorings and other substances, provided in a refillable cartridge. Many are designed to simulate smoking cigarettes or cigars, in their use and/or appearance.<sup>1</sup> Among New Jersey high school students, 6.1% ( $\pm 1.5$ ) reported being current users of e-cigarettes. Males (7.8  $\pm 2.5\%$ ) were more likely to be current users compared to females (4.3  $\pm 1.1\%$ ), and white (6.4  $\pm 2.2\%$ ) and Hispanic (7.7  $\pm 2.6\%$ ) students were more likely to be current e-cigarette users than black students (3.2  $\pm 2.5\%$ ), although these differences were not statistically significant. There also were no significant differences by grade level, however, 12<sup>th</sup> graders reported the highest prevalence of current use (8.5  $\pm 3.9\%$ ).

### Current Snus Use

Another tobacco product gaining popularity is snus, a moist powder smokeless tobacco product which is used by placing under the upper lip. Among New Jersey high school students only 2.3% ( $\pm 0.8$ ) reported being current users of snus. As with other SLT products, male students (2.9  $\pm 0.8\%$ ) were two times more likely to report current use than female (1.4  $\pm 1.0\%$ ) students. However, in contrast to current SLT use, where white high school students reported the highest prevalence of current use, black (4.0  $\pm 2.5\%$ ) and Hispanic (3.4  $\pm 1.7\%$ ) students reported higher prevalence of current snus use when compared to white (1.4  $\pm 0.9\%$ ) students.

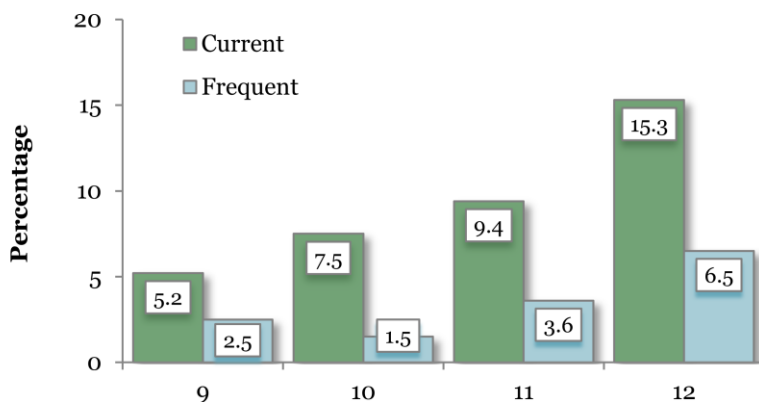
**Figure 6: Prevalence of current tobacco use among all high school students, by type of tobacco product – NJYTS 2012**



### Frequent Use of Cigarettes

The NJYTS also examined the prevalence of frequent cigarette smoking, defined as smoking cigarettes on 20 or more days of the 30 days preceding the survey. Overall, 3.5% ( $\pm 0.7$ ) of high school students were frequent smokers in 2012, representing not only a significant decrease over the past decade from 13.8% ( $\pm 2.2$ ) in 1999, but a significant decrease from 5.4% ( $\pm 1.1$ ) in 2010.

**Figure 7: Prevalence of current and frequent smoking among all high school students, by grade level – NJYTS 2012**



In previous years, the prevalence of frequent cigarette smoking trended upward with grade level. Male high school students (4.6  $\pm 1.2\%$ ) were significantly more likely to be frequent smokers compared to female high school students (2.3  $\pm 0.5\%$ ). Frequent smoking was more prevalent among white high school students (4.2  $\pm 1.1\%$ ) and Hispanic (3.6  $\pm 1.0\%$ ) compared to black (1.6

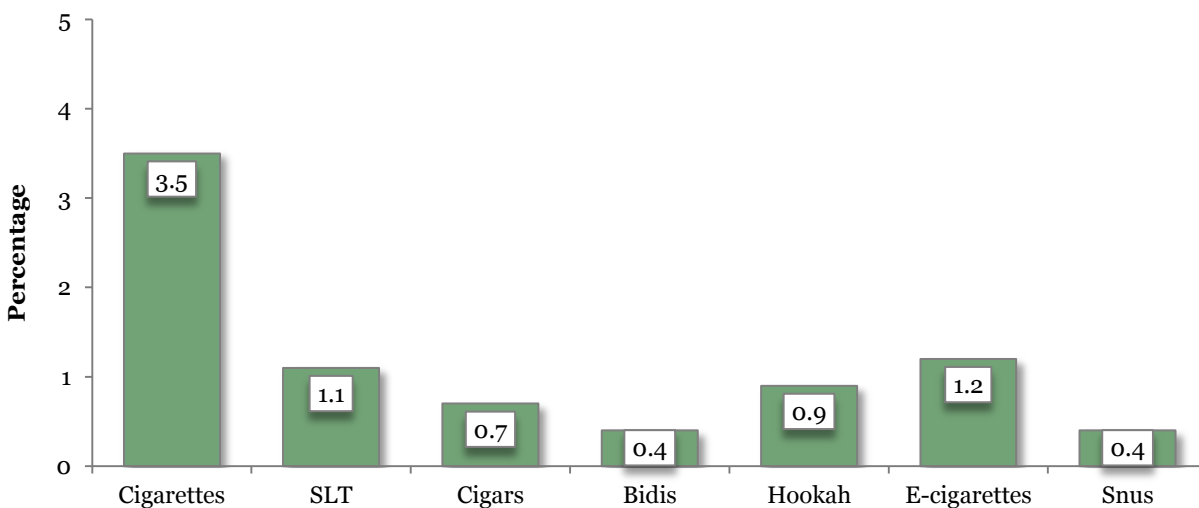
±1.1%) high school students in 2012, however these differences were not statistically significant.

**Frequent Use of Other Tobacco Products**

Cigarettes, as noted above, had the greatest prevalence of frequent use by high school students for all tobacco products. In regards to other tobacco products (OTP), prevalence of frequent use was highest for smokeless tobacco (1.1 ±0.5%) and e-cigarettes (1.2 ±0.4%). Despite being the second most popular tobacco product among high school students overall (see Table 1), frequent use (20 or more days per month) of cigars was not common.

Less than one percent (0.7 ±0.3%) of high school students reported smoking cigars on 20 or more days in the past 30 days. Similarly, only 0.9% (±0.2) of students reported frequent use of hookah and 0.4% (±0.1) for each of bidis and snus (Figure 8). These results suggest that use of cigars, smokeless tobacco, bidis and hookah remains largely occasional and experimental, and that high school students are also experimenting with e-cigarettes and snus.

**Figure 8: Prevalence of frequent use by type of tobacco product among all high school students – NJYTS 2012**

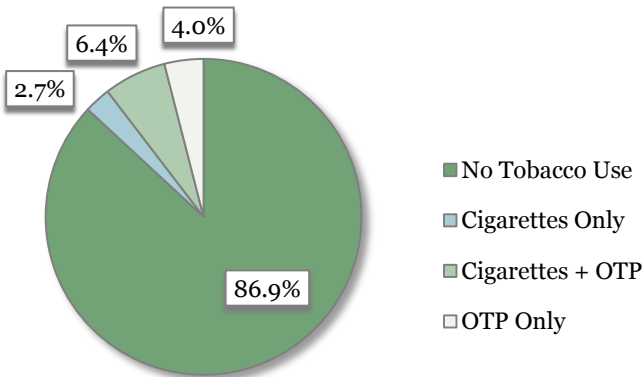


**Dual or Concurrent Tobacco Use**

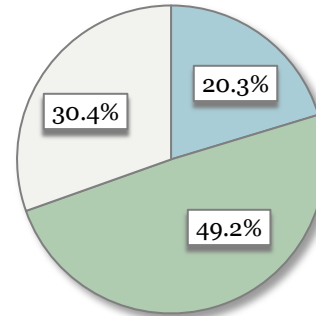
Among all high school students, 6.4% (±1.6) reported dual use of cigarettes and at least one other tobacco product (OTP: cigars, SLT, bidis, hookah, snus, and e-cigarettes), 4.0 % (±1.3) reported use of OTP only, and 2.7% (±0.9) reported use of cigarettes only (Figure 9). Overall, these prevalence estimates represent a decrease from 2010. More than half (63.8 ±8.2%) of current cigarette smokers, and 76.3% (±9.2) of frequent cigarette smokers, reported concurrent use of at least one other tobacco product. Further, use of OTP alone (i.e., tobacco users who do not use cigarettes but use at least one OTP) was more commonly reported than use of cigarettes alone.

**Figure 9. Prevalence and concurrent use of cigarettes and other tobacco products (OTPs; includes cigars, SLT, bidis, hookah, snus, and e-cigarettes) - NJYTS 2012**

**Among All High School Students**



**Among Current Tobacco Users**



There was no difference in the report of dual use among male smokers (48.6 ±14.7%) when compared to female smokers (50.3 ±8.8%). However, females (29.3 ±10.3%) were more likely to report use of cigarettes-only than males (14.7 ±6.0%), while males (36.7 ±12.7%) were more likely to report use of OTP-only than females (20.4 ±10.9%). None of these gender differences, however, were significant. In contrast to the 2010 NJYTS, there was a higher prevalence of dual use reported among Hispanic (52.6 ±13.2%) high school smokers compared to black (38.9 ±18.9%) and white (48.9 ±16.7%) high school smokers, but again, these differences were not statistically significant. There also were no significant differences in prevalence of dual use by grade level; however, 9<sup>th</sup> graders (55.5 ±18.1%) had the highest prevalence of reported dual use.

**Strategies to Reduce Youth Smoking**

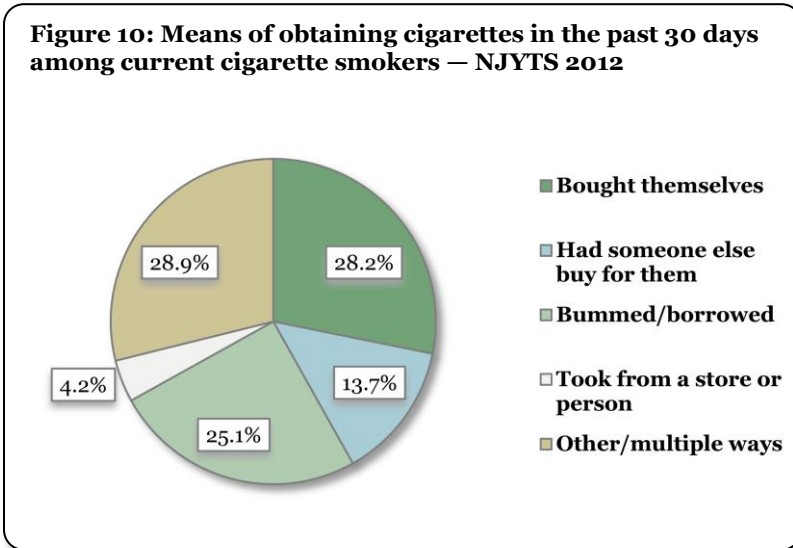
Strategies to reduce youth smoking include policies and programs that attempt to change social norms, availability, and/or regulation of tobacco. This section addresses youth access to tobacco, exposure to secondhand smoke, awareness of empowerment program activities, and interest in smoking cessation services among New Jersey youth.

**Access and Purchasing of Cigarettes**

As shown in Figure 10, the most common way of obtaining cigarettes for current high school smokers was buying the product in stores themselves (28.2 ±6.1%), followed by borrowing or “bumming” them (25.1 ±5.2%). In April 2006, the state of New Jersey raised the legal age to purchase cigarettes from 18 years to 19 years. Despite this increase in the legal age, in 2012, more than one-third (36.6 ±8.0%) of current high school smokers under the age of 19, reported usually obtaining their cigarettes by buying them in stores.

In 2010 and 2008, the NJYTS did not allow for the identification of students who were between the ages of 18 and 19, and students were considered under age if they were less than 18 years old. Thus, reported estimates for underage purchase of cigarettes in 2008 (32.2% ±6.6) and 2010 (33.4% ±6.2) may have been low and a direct comparison of prevalence for those years and 2012 may not be reliable.

**Figure 10: Means of obtaining cigarettes in the past 30 days among current cigarette smokers — NJYTS 2012**



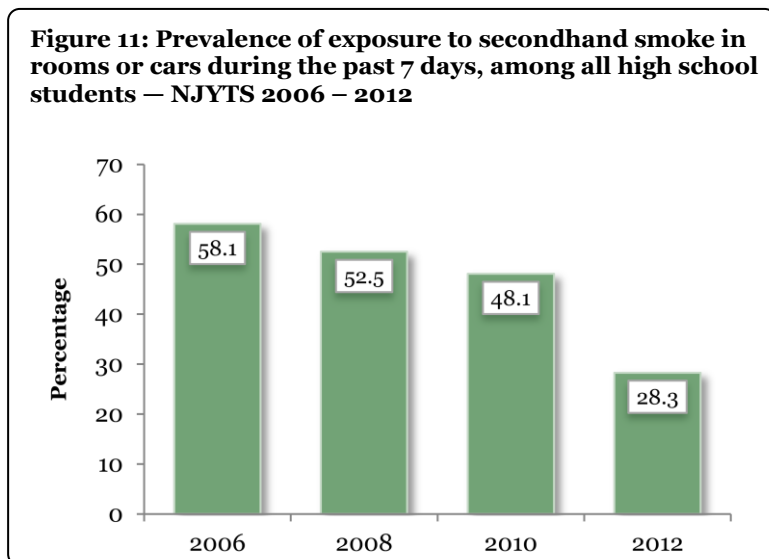
In 2012, 63.4% (±9.3) of current smokers in high school under the age of 19 who bought or tried to buy cigarettes in the 30 days preceding the survey reported they were **not** refused because of their age. Again, comparison with 2010 or 2008 prevalence is not optimal. However, the prevalence of underage sales in 2012 has not improved when compared to 2006 (60.2 ±5.0%).

The unchanged availability of retail cigarettes over the past several years suggests a need for increased and continued enforcement of tobacco age of sale regulations in New Jersey. Further, youth may obtain cigarettes by purchasing a single cigarette, known as a loose cigarette or “loosie.” Although the sale of loose cigarettes is illegal in New Jersey, many youth reported access to them. Similar to prior years, 34.9% (±6.5) of high school students reported awareness of places that sold loose cigarettes. Black (53.5 ±6.8%) and Hispanic (51.7 ±7.5%) high school students were significantly more likely than white students (23.0 ±4.4%) to report awareness of places that sold loose cigarettes.

### Secondhand Smoke

In 2012, 28.3% (±5.5) of high school students reported being exposed to secondhand smoke (SHS) in either their homes or in vehicles in which they were riding in the seven days preceding the survey. Overall, this finding represents a significant decline from 48.1% (±4.1) in 2010 and earlier years (Figure 11). The New Jersey Smoke-Free Air Act (NJSFAA) was enacted on April 15, 2006. The Act prohibits smoking in most indoor public places and workplaces. The

**Figure 11: Prevalence of exposure to secondhand smoke in rooms or cars during the past 7 days, among all high school students — NJYTS 2006 – 2012**



2012 NJYTS also asked students about possible exposure to SHS while at work. Among all high school students, 6.9% ( $\pm 1.7$ ) reported they had breathed the smoke from someone who was smoking in the place where they worked, a significant decrease from 2006 (10.8  $\pm 1.3$ %). These significant declines in reported exposure to secondhand smoke in homes or vehicles, or at work, suggest that the NJSFAA may have had some success in reducing youth exposure to secondhand smoke.

In addition, in 2012, 83.5% ( $\pm 3.9$ ) of high school students reported that smoking was never allowed inside their home. Among all high school students, 26.3% ( $\pm 3.6$ ) reported living with a smoker and among current smokers, 47.3% ( $\pm 8.5$ ) reported living with someone who currently smokes cigarettes. Current smokers were significantly more likely to report living with a smoker than non-smokers (47.3  $\pm 8.5$ % vs. 24.3  $\pm 3.5$ %). Further, 80.4% ( $\pm 3.5$ ) of high school students reported that smoking was never allowed in the vehicles they or their family own or lease. This represents a significant increase when compared to 2010 (70.0  $\pm 3.7$ %) and earlier rates. However, it should be noted that the wording of this question changed from prior years (i.e., “vehicles that you and family members who live with you own or lease” as opposed to “vehicles you drive or ride in the most”) which could account for the significant increase.

### **Youth Empowerment**

The 2012 NJYTS included questions on awareness of youth tobacco advocacy activities. Among New Jersey high school students, 31.0% ( $\pm 5.1$ ) reported being taught in classes why tobacco should not be used and 13.8% ( $\pm 3.3$ ) reported practicing ways in classes to say ‘No’ to tobacco. In addition, 7.5% ( $\pm 1.4$ ) reported having participated in school-organized activities to discourage people their age from using cigarettes or other tobacco products in the past 12 months. There were no gender or grade level differences associated with participation in these school-organized activities. However, black students were significantly more likely to participate than white students (11.2  $\pm 3.6$ % vs. 5.5  $\pm 1.4$ %).

### **Smoking Cessation**

In 2012, 44.5% ( $\pm 9.8$ ) of current high school smokers reported the desire to stop smoking. There were no significant differences in the desire to quit by gender, race/ethnicity or grade level, nor were there any statistically significant differences in the proportion of current smokers who reported wanting to stop smoking between 2010 (53.0  $\pm 7.2$ %) and 2012.

Despite almost half of high school smokers reporting a desire to quit, only a small proportion of smokers reported awareness of available cessation aids. Among frequent high school smokers, 24.9% ( $\pm 16.2$ ) had heard of NJQuitline, a telephone counseling service to help teens and adults quit smoking. In addition, only 13.7% ( $\pm 9.7$ ) of frequent smokers and 11.8% ( $\pm 9.7$ ) of current smokers who want to quit reported awareness of their school offering groups or classes to help them quit.

Of frequent smokers, 57.1% ( $\pm 10.2$ ) reported they had a doctor, dentist, nurse or other health professional ask them if they smoked during the previous 12 months, and 37.0% ( $\pm 14.2$ ) reported a health professional had advised them not to smoke. The proportions of students being asked about smoking and being advised not to smoke did not differ by gender, race or grade and remained statistically unchanged from 2010.



## CONCLUSIONS

### Overview of Findings

The *2012 New Jersey Youth Tobacco Survey: A Statewide Report* provides an opportunity for assessing short and long-term impact of tobacco control programming in New Jersey. When comparing 2012 to 1999, several successes in youth tobacco use are notable. Since 1999, the overall prevalence of ever or lifetime tobacco use decreased 28% among high school students and current use of any tobacco decreased from 38.9% ( $\pm 2.4$ ) to an historic low of 13.6% ( $\pm 2.6$ ). Current cigarette smoking prevalence among New Jersey high school students has decreased dramatically from 27.6% in 1999 to 9.3% in 2012. Similarly, current cigar smoking prevalence decreased significantly from 18.4% in 1999 to 6.3% in 2012.

Although alarming increases in the prevalence of use of SLT and hookah, as well as a stalled decrease of bidi use, were observed in 2010, current use of these OTP appears to be on the decline again in 2012. However, the prevalence of ever or lifetime use of SLT and bidis since 2004, has decreased only minimally, dropping by only ~1.0%. In addition, the prevalence of ever use of a hookah, also referred to as a water pipe or narghile<sup>2</sup>, has remained relatively level and is even slightly higher than when first reported in 2008 (17.9% vs. 18.5%).

It is also important to note that 74% of current cigar users and 91.1% of current SLT users reported that the cigars or smokeless tobacco they used were flavored. In fact, the highest prevalence of flavored cigar or flavored SLT use was among 9<sup>th</sup> graders. Flavors can mask the harshness and taste of tobacco, making flavored tobacco products appealing to youth. And with flavors now banned in cigarettes, youth may increasingly turn to cigars and other products that are still able to offer flavored brands.

In addition, 6.1% reported current use of e-cigarettes, another product offering flavored brands. The market for e-cigarettes is small but growing. The 2012 NJYTS was the first to include questions about e-cigarette use and so comparisons to other YTS administrations were not possible. Continued monitoring of e-cigarette use is needed to assess trends over time and inform policy and program interventions.

Although the current smoking prevalence among New Jersey high school students has decreased and rates of any tobacco use among demographic groups were statistically similar, gender and racial/ethnic disparities in use of other tobacco products persist. High school males reported greater lifetime and current use of cigars, smokeless tobacco, snus, e-cigarettes as well as dual use (cigarettes plus OTP) compared to high school females and, compared to whites current use of hookah was significantly higher among Hispanics. These findings underscore the importance of monitoring the differing patterns of tobacco product use across sex and racial/ethnic groups.

The number of New Jersey youth who obtain their cigarettes from retail outlets continues to increase. In 2012, 37% of high school smokers under the age of 19 purchased their cigarettes from a retail store, representing an increase from 29% of underage smokers in 2004. Further, 63% of smokers who bought or

tried to buy cigarettes in a retail store were not asked to show proof of age, compared to 60% in 2006, and 35% of students indicated awareness of retailers that (illegally) sold single or loose cigarettes (aka “loosies”). Black and Hispanic high school students were two times more likely than white students to know where to buy single cigarettes. These findings suggest that it continues to be easy for youth to obtain cigarettes through illegal retail sale.

Secondhand smoke (SHS) exposure is a New Jersey tobacco control priority area monitored by the NJYTS. Since the enactment of the New Jersey Smoke-Free Air Act (NJSFAA) on April 15, 2006, a significant reduction in the percent of high school students reporting SHS exposure at work was reported in 2012 (6.9% versus 20.4% in 2006). Further, there was a significant 29% decrease in reported SHS exposure in either rooms or cars during the seven days preceding the survey from 2006 to 2012. These results suggest the NJSFAA may have helped reduce exposure to SHS among New Jersey youth.

Although direct comparisons are not valid, it is useful to consider time trend results from the NJYTS in the context of other surveys assessing youth tobacco use (e.g., National Youth Risk Behavior Survey (NYRBS)). According to the NYRBS, the percentage of all U.S. high school students who reported ever smoking cigarettes decreased significantly from 64% in 2001 to 45% in 2011.<sup>3</sup> This downward trend is similarly noted for New Jersey students in the NJYTS data, which demonstrated that the lifetime smoking prevalence among New Jersey high school students decreased from 60% in 2001 to 30% in 2012. Further, similar trends are noted for current cigarette smoking for high school students. The NYRBS found current cigarette smoking among all U.S. high school students to be 29% in 2001 and 18% in 2011<sup>3</sup> while the NJYTS found current smoking among New Jersey high school students to be 25% in 2001 and 9% in 2012.

## Limitations

Several limitations of the 2012 NJYTS warrant notation. First, and foremost, the effects of Hurricane Sandy at the end of October 2012, resulted in delays, rescheduling and cancellations of survey administration. A number of schools that had agreed to take part were no longer willing and/or able to set aside class time for survey participation. Despite this challenging, but successful administration, the 2012 NJYTS has the smallest sample size and lowest participation rate of any previously conducted NJYTS.

Second, the wording of some questions in the 2012 survey was slightly modified from the 2010 survey. In addition, the order of presentation for some question groups (for example, questions on quitting tobacco products) was different in the 2012 version of the NJYTS compared to the 2010 NJYTS. These changes in wording and item presentation may have affected students’ responses, and thus reported prevalence. Third, in 2006 New Jersey passed a law to raise the legal age to purchase tobacco from 18 to 19 years. The 2006, 2008, and 2010 NJYTS did not ask survey participants to identify their exact age if they were older than 18, however, the 2012 NJYTS was modified to allow for identification of high school students age 19 or older. Thus, estimates of prevalence of under-age purchases of tobacco products derived from the 2012 NJYTS are not directly comparable to the 2006 - 2010 estimates. Fourth, private schools were in the sampling frame in the 1999, 2001, and 2004 NJYTS administrations, but not in the 2006, 2008, 2010 and

2012 protocols. Analyses of NJYTS data indicate that the inclusion of private school students resulted in slightly lower estimates of tobacco use<sup>5</sup> and as such, should be considered when comparing trends over time. Fifth, the questions about hookah were added in 2008, so comparisons over time are limited to the latest two NJYTS administrations. Lastly, while NJYTS data is useful to monitor outcome indicators such as smoking prevalence, it cannot be used to determine causality and as such, the NJYTS cannot assess the direct impact of state tobacco control programming on the prevalence of tobacco use among New Jersey youth.

## Recommendations

After more than a decade of tobacco control programming in New Jersey, it appears that overall tobacco use is decreasing again among NJ youth. However, the increasing popularity of other forms of tobacco plus new, emerging tobacco products, warrants concern. For instance, hookah is now second only to cigarettes in popularity among youth. Further, a considerable proportion of smokeless tobacco users and e-cigarette users are identified as frequent users, and almost half of current tobacco users are smoking cigarettes and using another tobacco product. In light of these findings, strategies to prevent and reduce youth cigarette use – price, access, education, and counter marketing – should focus on *all* tobacco products and should actively engage more males and minority youth in tobacco control programming activities.

An upward trend in the availability of tobacco to underage youth has been observed. In 2009, the Tobacco Age of Sale (TASE) program, whose efforts successfully increased the proportion of merchants in compliance with the age-of-sale law, was restructured, and the number of random retail inspections decreased. At the same time, the proportion of youth who reported obtaining their cigarettes from retail outlets and/or reported not being asked for proof of age when buying cigarettes has risen<sup>6</sup>. In addition, youth awareness of retailers that sold single or loose cigarettes has persisted. To reduce illegal sales of tobacco products to youth, tobacco sales regulations and enforcement in New Jersey should be strengthened.

Since New Jersey passed the NJSFAA in 2006 banning smoking in public places, including worksites, a significant decrease in the proportion of students reporting exposure to SHS at work, in their homes or vehicles was observed in 2012. Although this suggests a positive impact of the NJSFAA, some worksite SHS exposure still persists, as 33% of NJ high school students who have jobs reported being exposed to second hand smoke at their workplace. In addition, nearly one-third of youth continue to report exposure to smoke in either homes or vehicles in 2012. To further reduce SHS exposure among youth, New Jersey tobacco control programs should increase NJSFAA enforcement and promote the adoption of private non-smoking household rules.<sup>6</sup>

## TECHNICAL NOTES

### Instrument

Students were surveyed using the 2012 NJYTS instrument which was designed to meet specific needs of the OTC. The NJYTS addresses eight content areas: tobacco prevalence, access to tobacco, smoking cessation, smoking intention, perceived consequences of tobacco use, mass media, awareness of tobacco industry strategies, and environmental tobacco smoke. In 2012, race/ethnicity data was collected in a manner consistent with the 2009 NYTS and NYRBS, which differs from pre-2008 administrations of the NJYTS. To draw comparisons to state and national trends from previous YTS administrations, the data collected from these two variables were combined to create an overall race variable according to the algorithm currently used for the NYRBS. Race/ethnicity was determined by responses to two questions: 1) "Are you Hispanic or Latino?" (Yes/No), and 2) "What race or races do you consider yourself to be?" ("American Indian or Alaska Native," "Asian," "black or African American," "Native Hawaiian or other Pacific Islander," or "white"). For this report, students answering "Yes" to the first question were classified as Hispanic; students answering "No" to the first question were classified according to their response to the second question.<sup>7</sup> In 2008, questions about hookah use were introduced to the YTS questionnaire, and in 2012, questions about e-cigarette and snus use. For consistency when comparing trends over time, use of hookah, e-cigarette and snus were excluded when calculating lifetime and current rates of *any* tobacco use.

### Sample

A two-stage cluster design was used to obtain a representative sample of students in grades 9-12. The first-stage sampling frame consisted of all public high schools in New Jersey and was then stratified by percent minority enrollment. Schools were selected with a probability proportional to size (PPS), within each stratum, without replacement, for a total of 39 high schools. The second stage of sampling involved the random selection of approximately 4 classes within sampled schools.

The NJYTS surveyed a representative sample of all public high school students in New Jersey. The survey was administered to 1864 high school students (grades 9-12) in 27 schools throughout New Jersey, of which 1850 completed usable questionnaires. An overall participation rate of 60.32% was achieved. Overall participation rates were calculated by multiplying the school participation rate (72.97%) by the student participation rate (82.66%). The data were weighted to adjust for non-response and the varying probabilities of selection providing results representative of New Jersey's 9<sup>th</sup>-12<sup>th</sup> grade student population.

The 2012 NJYTS administration was interrupted due to the devastating effects throughout New Jersey of Superstorm Sandy at the end of October. Survey administration was delayed for several weeks while power was restored to communities, and schools were repaired and/or reopened. Several schools that had agreed to participate in the 2012 survey were unable, or unwilling, to reschedule due to lost class time. Of those high schools, two were declared ineligible because of the severity of the damage to the schools. However, despite these setbacks, and as noted above, survey administration was completed and a sufficient overall participation rate was achieved.

### Analysis

SUDAAN 10 and SAS 9.2 survey procedures, which take into account the complex sample design of the survey, were used to generate all prevalence estimates. Differences between estimates were considered statistically significant at the  $p = 0.05$  level if 95% confidence intervals did not overlap.<sup>8</sup>

## GLOSSARY

<b>Bidis</b>	Small, brown, hand-rolled cigarettes primarily made in India and other Southeast Asian countries; often flavored.
<b>CDC</b>	Centers for Disease Control and Prevention; an agency of the US Department of Health and Human Services.
<b>Current Use</b>	Defined as the use of tobacco on one or more of the 30 days preceding the survey.
<b>E-cigarette</b>	Electronic cigarette, also electronic vaping device, personal vaporizer, or electronic nicotine delivery system (ENDS); a battery-powered device which simulates tobacco smoking
<b>Ever Use</b>	Defined as the use of a tobacco product over the course of one's lifetime.
<b>Frequent Use</b>	Defined as the use of a tobacco product on 20 or more days of the past 30.
<b>High School Students</b>	Students who were in 9 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> , or 12 <sup>th</sup> grade at the time of the survey.
<b>Hookah</b>	A water pipe that is used to smoke tobacco and flavored tobacco usually in a group setting; also called hubble-bubble, water-pipe or narghile.
<b>NJYTS</b>	The New Jersey Youth Tobacco Survey is a population-based survey to monitor tobacco use among New Jersey youth.
<b>NYRBS</b>	The National Youth Risk Behavior Survey is a population-based survey designed to monitor priority health risk behaviors that contribute markedly to the leading causes of death, disability, and social problems among youth in the United States.
<b>OTC</b>	The Office of Tobacco Control (formerly the Comprehensive Tobacco Control Program) is the current tobacco control program at NJDOH. Its mission is to decrease deaths, sickness and disability among New Jersey residents who use tobacco or are exposed to SHS.
<b>OTP</b>	Other tobacco products (tobacco products other than cigarettes)
<b>SHS</b>	Secondhand smoke; a mixture of the smoke given off by the burning end of a cigarette, pipe, or cigar and smoke exhaled from the lungs of smokers
<b>SLT</b>	Smokeless tobacco (such as chew, snuff or dip)
<b>Snus</b>	A moist powder smokeless tobacco product used by placing under the upper lip.
<b>TASE</b>	Tobacco Age of Sale Enforcement

## REFERENCES

1. McQueen, Amy; Tower, Stephanie; Sumner, Walton (2011). Interviews with "vapers": Implications for future research with electronic cigarettes. *Nicotine & Tobacco Research* **13** (9): 860–7. doi:10.1093/ntr/ntro88. PMID 21571692
2. Knishkowsky, B. Amitai, Y. Water-Pipe (Narghile) Smoking: An Emerging Health Risk Behavior. *Pediatrics*, 2005; 116: 113-119.
3. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance – United States, 2007. *Surveillance Summaries*. June 6, 2008. MMWR 2008; 57 (No. SS-4).
4. Simard, EP, Delnevo, CD, Hrywna, M, Berger, HF, Chee-Chait, JK, Momperousse D. The 2006 New Jersey Youth Tobacco Survey: A Statewide Report. New Brunswick, NJ: University of Medicine and Dentistry of New Jersey-School of Public Health; May 2007.
5. Riordan, Meg. The Impact of Reductions to State Tobacco Control Program Funding. The Campaign for Tobacco Free Kids; Feb 2011. Available at <http://www.tobaccofreekids.org/research/factsheets/pdf/0270.pdf>. Accessed Feb 22, 2011.
6. US Department of Health and Human Services. The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General. Atlanta, Georgia: US Department of Health and Human Services, CDC; 2006.
7. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance – United States, 2013. *Surveillance Summaries*. June 13, 2014. MMWR 2014; 63 (No. SS-4).
8. Research Triangle Institute. SUDAAN: software for the statistical analysis of correlated data, release 9.0, 2004 [user's manual]. Research Triangle Park, NC: Research Triangle Institute; 2004.

PREPARED BY:

**RUTGERS**  
School of Public Health

PREPARED FOR:



<http://www.state.nj.us/health/>

---

For more information please contact (609) 292-9194

---