



**Emerging Tobacco Use Among Rhode Island High School Students:
Understanding Youth Tobacco Use at the City/Town Level**

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April 11, 2017

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Welsh Boles E, Guardino GA, Abdullahi N, Larson HE, Pearlman DN. *Emerging Tobacco Use Among Rhode Island High School Students: Understanding Youth Tobacco Use at the City/Town Level*. Rhode Island Department of Health, Division of Community, Family Health, and Equity, Tobacco Control Program, April 11, 2017.

Acknowledgements

This work was supported in part by grant U58DP005991 from the Centers for Disease Control and Prevention. The content is solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

We thank Angela M. Lemire, Communications Coordinator, Rhode Island Department of Health Tobacco Control Program for her thoughtful comments and editing of this brief.

We also thank the following people for their support of the Rhode Island Department of Health Tobacco Control Program's work to understand the landscape of adolescent tobacco use at the city/town level: Marco Andrade, PhD, Director of the Office of Research, Planning and Accountability, Providence Public Schools District; and Elizabeth Farrar, Associate Administrator, Office of Prevention, Rhode Island Department of Behavioral Healthcare, Developmental Disabilities and Hospitals.

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Introduction

Point-of-sale (POS) strategies that restrict exposure to flavored and discounted tobacco and nicotine products are the next frontier for reducing youth tobacco use.¹ The substantial decline in adolescent cigarette use over the past few decades is a notable public health achievement.² However, this decline is threatened by a recent increase in use of emerging tobacco products, such as e-cigarettes, hookah, cigars, cigarillos, and smokeless tobacco, which are sold in flavors with strong youth appeal.³ Most adolescents who have experimented with tobacco products began with flavored products.^{4,5,6} Initiation is greatly influenced by curiosity, appealing flavors and peer influence,⁷ and the density of tobacco retailer stores in a community.⁸ Adolescents are also particularly sensitive to price discounting of tobacco products at POS (e.g., buy-one-get-one free offers and coupon redemptions), which play an important role in youth tobacco use.⁹

With support from the Centers for Disease Control and Prevention (CDC) and the Rhode Island Department of Health (RIDOH) the City of Providence implemented two innovative point of sale strategies. Both ordinances were aimed at reducing youth access to tobacco products, and keeping tobacco prices high given that youth are price sensitive. In fact, Providence became the first city in the United States to pass a ban on price discounting, including coupon redemption and multi-pack discounts.¹⁰ In addition, Providence banned the sale of flavored tobacco products, except for menthol, outside of a tobacco bar, and required that tobacco retailers obtain a local tobacco license. These strategies became the Rhode Island Model Tobacco Policy, and took effect in 2012.

In 2015 the Rhode Island Department of Health Tobacco Control Program (RIDOH TCP) won a two-year CDC grant from the Office on Smoking and Health. The competitive grant was awarded to five states to advance evidence-based tobacco control through rigorous evaluation of innovative and/or promising practices. Rhode Island's grant award supported the community infrastructure needed to advance the adoption of the Rhode Island Model Tobacco Policy at the city/town level.

This brief highlights adolescents' uptake of tobacco products in the cities of Providence, Cranston, and Woonsocket. Specifically, we explored whether the prevalence of current tobacco use in 2016 was lower among high school students in the City of Providence than in the two cities that had not yet passed the Rhode Island Model Tobacco Policy.

Methods

Data for this brief were obtained from the 2016 Annie E. Casey Foundation Evidence2Success Youth Experience Survey (YES) and the 2016 Rhode Island Student Survey (RISS). Both surveys are cross-sectional, school-based questionnaires administered to middle and high school students. The Providence Public Schools Office of Research, Planning & Accountability oversees the YES. The 2016 YES high school sample included 9th, 10th and 12th grade students in eight (8) Providence public high schools. The survey was administered as an on-line survey and required active parental consent. The total sample was 2,245 high school students.

The Rhode Island Department of Behavioral Healthcare, Developmental Disabilities and Hospitals has oversight for the RISS. The high school survey was administered in two different formats: a paper version and an on-line version. Both versions required active parental consent. The RISS sample for the cities of Woonsocket and Cranston included Woonsocket High School

(grades 9th – 12th), Cranston East High School (grades 9th – 12th), and Cranston West High School (grades 9th -11th). The total sample for the three schools was 1,968 high school students.

Table 1a shows the questions for current (30-day) use of conventional cigarettes in the 2016 YES and 2016 RISS. Both surveys included identical questions on current (30-day) use of and access to emerging tobacco products (*Table 1b*). Additional tobacco questions, such as peer attitudes toward and use of tobacco products, perceived harm of using tobacco products, and frequency of vaping were not analyzed for this brief.

High school students who checked a box (i.e.) for a specific product were classified as “current users” of that product, whether or not they checked boxes indicating that they used other tobacco products, or they checked the box for “I have not tried any tobacco products.” For example, high school students who selected “” for e-cigarettes were counted as having used e-cigarettes in the past 30 days even if they also selected “” to indicate that they had not tried any tobacco products. The same approach was used to calculate the prevalence of getting tobacco products in a convenience store, supermarket, discount store, or gas station. High school students who checked a box indicating that they usually got their own tobacco products from a store were counted as currently getting tobacco products from that source, whether or not they also checked boxes indicating that they got their tobacco products from other sources, such as friends, or they selected “I have not tried any tobacco products.” The results of these analyses are shown in *Tables 2 and 3* with 95% confidence intervals. Confidence intervals are a range of values. If repeated samples are taken and the 95% confidence interval is computed for each sample, 95% of the intervals would contain the “true” prevalence.

Results

Overall, current use of conventional cigarettes among high school students in the City of Providence was twice that of high school students in the City of Cranston (measured as use in the past 30 days; *Table 2*). A higher percentage of high school students in the City of Providence than in the City of Woonsocket currently smoked cigarettes but the difference between the two groups of high school students was not statistically significant.

Current use of flavored tobacco products, e-cigarettes and hookah was notably lower among high school students in the City of Providence than high school students in the cities of Cranston and Woonsocket. Although current use of cigarillos and large cigars was lower among high school students in the City of Providence than high school students in the City of Cranston, the 95% confidence intervals for these two products slightly overlapped in the two samples. Current use of the emerging tobacco products (i.e., flavored tobacco, e-cigarettes, cigarillos, large cigars and hookah) was consistently higher among high school students in the City of Woonsocket than high school students in the cities of Providence and Cranston.

The percentage of high school students that said they bought their own tobacco products from a store was higher among high school students in the City of Woonsocket than high school students in the cities of Providence and Cranston. A higher percentage of high school students in Providence than in Cranston said they bought tobacco products from a store, but the 95% confidence intervals slightly overlapped in these two samples.

Conclusion

These findings provide a snapshot of the landscape of adolescent tobacco use in Rhode Island. The uptake of flavored tobacco products reported by high school students in the City of Providence was notably lower than among high school students in the other two cities highlighted in this report. It cannot be said with certainty that the differences observed can be attributed solely to Providence's four-year enforcement of the Rhode Island Model Tobacco Policy. Nevertheless, the findings are promising. Farley and colleagues evaluated New York City's ban on the sale of flavored tobacco products (e.g., cigars, cigarillos, little cigars, chew, snuff, snus, pipe tobacco, roll-your-own tobacco, and dissolvables, excluding menthol).¹¹ They found a significant decrease in adolescents' use of flavored tobacco products in 2013 compared with 2010 when the ban was implemented, and concluded that New York City's flavor ban was a viable form of tobacco control.¹¹

The findings reported in this brief also suggest that there may have been unintended consequences as a result of the implementation and enforcement of Providence's tobacco policy bans. Although the RIDOH TCP does not yet have data to confirm this hypothesis, it is possible that as flavored tobacco products became less accessible to teens, high school students in Providence who were attracted to smoking resorted to using conventional cigarettes. High school students in grades 10 and 12 participating in the 2012 YES, for example, had low rates of cigarette use (3.0%).¹² In the 2016 YES, nearly 8% of high school students in grades 9, 10 and 12 currently smoked cigarettes.

This brief has three important limitations. First, longitudinal data are needed to show trends in adolescents' uptake of emerging tobacco products. Second, the 2016 YES and RISS differed in the high school grades included in the sample and total sample size. Third, findings for current cigarette use should be interpreted with caution given how the questions were phrased differently in the two surveys (*Table 1a*). Differences in question wording may have contributed to the higher prevalence of cigarette smoking among high school students in the City of Providence than in the cities of Cranston and Woonsocket.

Despite these limitations, the findings presented in this brief provide the first snapshot of youth tobacco use at the city/town level in Rhode Island. The widespread appeal of flavored products among youth tobacco users is well documented. This brief provides preliminary evidence that prohibiting the sale of flavored tobacco products could contribute to reductions in tobacco use among high school age youth. Comprehensive efforts to decrease use of flavored tobacco products among youth should include local ordinances that ban the sale of flavored tobacco products. Citywide bans on selling flavored tobacco are being considered in Cranston and Woonsocket.

Table 1a. Survey Questions on Current Conventional Cigarette Use in the 2016 Youth Experience Survey (YES) and 2016 Rhode Island Student Survey (RISS)

| Survey | Current conventional cigarette use |
|-----------|--|
| 2016 YES | <p>How frequently have you smoked cigarettes during the past month (30 days)? (Count regular tobacco cigarettes, but not electronic cigarettes or vaping).</p> <p><u>Response options</u></p> <p>1 = Not at all 2 = Less than one cigarette per day 3 = One to five cigarettes per day 4 = About one-half pack per day 5 = About one pack per day 6 = About one and one-half packs per day 7 = Two packs or more per day</p> |
| 2016 RISS | <p>During the past 30 days did you smoke all or part of a cigarette?"</p> <p><u>Response options</u></p> <p>Yes No</p> |

Table 1b. Survey Questions on Current 30-Day Use of and Access to Emerging Tobacco Products in the 2016 Youth Experience Survey (YES) and 2016 Rhode Island Student Survey (RISS)

| Tobacco use |
|--|
| <p>During the past 30 days which of the following products have you tried? (YOU CAN CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)</p> <p><input type="checkbox"/> I have not tried any tobacco products <input type="checkbox"/> Large cigars <input type="checkbox"/> Little cigars or cigarillos <input type="checkbox"/> Flavored tobacco products (excluding menthol) such as cigars, little cigars/cigarillos, shisha, chew, or electronic cigarettes <input type="checkbox"/> Hookah or water pipe <input type="checkbox"/> Electronic cigarettes or E-cigs such as NJOY or blu <input type="checkbox"/> Dissolvable tobacco products, such as Camel Orbs or Camel Sticks <input type="checkbox"/> Some other new tobacco products not listed here</p> |
| Tobacco access |
| <p>During the past 30 days, how did you usually get your own tobacco products? This includes cigarettes, cigars, hookah, e-cigarettes, chewing tobacco, snuff or Snus, dissolvable tobacco (dissolvables), bidis, or other flavored tobacco products.(YOU CAN CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)</p> <p><input type="checkbox"/> I did not use any tobacco products during the past 30 days <input type="checkbox"/> I bought them in a store such as a convenience store, supermarket, discount store, or gas station <input type="checkbox"/> I got them on the Internet <input type="checkbox"/> I took them from a store or another person <input type="checkbox"/> I got them some other way</p> |

Table 2. Percentage of high school students in the cities of Providence, Cranston and Woonsocket that currently use emerging tobacco products

| | Have you tried the following tobacco products in the past 30 days, “yes” or “no”? ¹ | | | | | | |
|--|--|---|--|--|--|------------------------------------|---|
| City/Town & School | Cigarettes % Yes (95% CI) | Flavored tobacco ⁵ % Yes (95% CI) | E-cigarettes % Yes (95% CI) | Cigarillos % Yes (95% CI) | Large cigars % Yes (95% CI) | Hookah % Yes (95% CI) | Any Use ⁶ (<i>Excluding Hookah</i>) % Yes (95% CI) |
| 2016 YES Sample #1 | | | | | | | |
| <u>City of Providence</u> ² | 7.6 (6.5 – 8.8) | 3.2 (2.3 – 4.0) | 3.8 (2.9 – 4.8) | 4.6 (3.5 – 5.6) | 3.6 (2.7 – 4.5) | 13.8 (12.2 – 15.4) | 11.9 (10.5 – 13.3) |
| | | | | | | | |
| 2016 RISS Sample #2 | | | | | | | |
| <u>City of Woonsocket</u> ³ | 6.8 (5.0 – 8.6) | 12.7 (9.9 – 15.5) | 14.4 (11.5 – 17.3) | 12.1 (9.3 – 14.8) | 9.9 (7.4 – 12.5) | 26.7 (23.3 – 30.1) | 16.5 (13.9 – 19.2) |
| <u>City of Cranston</u> ⁴ | 3.4 (2.4 – 4.4) | 7.6 (5.9 – 9.3) | 7.7 (6.0– 9.4) | 6.4 (4.8– 8.0) | 5.7 (4.2 – 7.2) | 19.3 (17.0 – 21.7) | 11.0 (9.2 – 12.7) |
| | | | | | | | |

CI: confidence intervals

¹ Each column shows the answer to one product. The % “Yes + the % “No’ (not shown) equal 100%. For example, 7.6% of high school students in the Youth Experience Survey currently smoke cigarettes and 92.4% did not smoke cigarettes in the past 30 days.

² The 2016 Youth Experience Survey (YES) for the City of Providence included 8 public high schools (grades 9, 10, and 12; n = 2,245).

³ The 2016 Rhode Island Student Survey (RISS) for the City of Woonsocket included Woonsocket High School (grades 9 – 12; n = 752).

⁴ The 2016 Rhode Island Student Survey (RISS) for the City of Cranston included Cranston East High School (grades 9 – 12; n = 759); and Cranston West High School (grades 9 – 11; n = 457).

⁵ Flavored tobacco products (excluding menthol) include cigars, little cigars/cigarillos, shisha, chew or electronic cigarettes.

⁶ Any use includes conventional cigarettes, e-cigarettes, flavored tobacco, cigarillos, and large cigars.

Table 3. Percentage of high school students in the cities of Providence, Cranston and Woonsocket who usually get their own tobacco products by buying them in a store or gas station

| | Where buy cigarettes, cigars, hookah, e-cigarettes, chewing tobacco, snuff or Snus, dissolvable tobacco (dissolvables), bidis or other flavored tobacco products | |
|--|--|---|
| City/Town & School ¹ | Total sample (N) | Bought in store ² % Yes (95% CI) |
| 2016 YES Sample #1 | | |
| <u>City of Providence</u> 8 public high schools | 2,245 | 7.3 (6.1 – 8.5) |
| 2016 RISS Sample #2 | | |
| <u>City of Woonsocket</u> Woonsocket High School | 752 | 9.5 (7.2 – 11.9) |
| <u>City of Cranston</u> High School East & High School West | 1,216 | 4.9 (3.6 – 6.3) |

¹ Please see notes for Table 2.

² Stores include convenience stores, supermarkets, discount stores or gas stations.

REFERENCES

- ¹ Center for Public Health Systems Science. Point-of-Sale Report to the Nation: The Tobacco Retail and Policy Landscape. St. Louis, MO: Center for Public Health Systems Science at the Brown School at Washington University in St. Louis and the National Cancer Institute, State and Community Tobacco Control Research Initiative, 2014.
- ² Arrazola RA., Kuiper NM, Dube SR. Patterns of current use of tobacco products among U.S. high school students for 2000–2012—Findings from the National Youth Tobacco Survey. *J. Adolesc. Health.* 2014;54:54.e59–60.e59.
- ³ Huang LL, Baker HM, Meernik C, Ranney LM, Richardson A, Goldstein AO. Impact of non-menthol flavours in tobacco products on perceptions and use among youth, young adults and adults: a systematic review. *Tob Control.* 2016. 21. pii: tobaccocontrol-2016-053196.
- ⁴ Ambrose BK, Day HR, Rostron B et al. Flavored tobacco product use among US youth aged 12-17 years, 2013-2014. *JAMA.* 2015;314(17):1871-1873.
- ⁵ Corey CG, Ambrose BK, Apelberg BJ, King BA. Flavored tobacco product use among middle and high school students--United States, 2014. *MMWR Morb Mortal Wkly Rep.* 2015; 64(38):1066–1070.
- ⁶ Pepper JK, Ribisl KM, Brewer NT. Adolescents' interest in trying flavoured e-cigarettes. *Tob Control.* 2016;25(Suppl 2):ii62-ii66.
- ⁷ Kong G, Morean ME, Cavallo DA, et al. Reasons for electronic cigarette experimentation and discontinuation among adolescents and young adults. *Nicotine. Tob Res.* 2015;17:847–54.
- ⁸ Novak SP, Reardon SF, Raudenbush SW, Buka SL. (2006). Retail tobacco outlet density and youth cigarette smoking: a propensity modeling approach. *Am J Public Health.* 2006;96, 670-676.
- ⁹ Center for Public Health Systems Science. Point-of-Sale Strategies: A Tobacco Control Guide. St. Louis: Center for Public Health Systems Science, George Warren Brown School of Social Work at Washington University in St. Louis and the Tobacco Control Legal Consortium; 2014.
- ¹⁰ Center for Public Health Systems Science. Regulating Price Discounting in Providence, Rhode Island. Innovative point-of-sale policies: Case Study #1. St. Louis; Center for Public Health Systems Science, George Warren Brown School of Social Work at Washington University in St. Louis. October 2013. <http://www.publichealthlawcenter.org/sites/default/files/resources/SCTC-case-study-Providence-pricing-2013.pdf>
- ¹¹ Farley SM, Johns M. New York City flavoured tobacco product sales ban evaluation. *Tob Control.* 2017;26(1):78-84.
- ¹² The Annie E. Casey Foundation. Providence Evidence2Success Youth Well-being Survey Report: 2012 Results from the Providence Public School District. The Social Development Research Group, University of Washington. November 7, 2012.