Three Year Trends In The *Use Of Emerging Tobacco* Products

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ABSTRACT

Background: Snus and electronic cigarettes have recently been introduced to the US market. These products and hookah waterpipes have been heavily promoted; however, to date, FDA only has regulated snus. We assess three year trends in use of these products among US adults, and current predictors of electronic cigarette use.

Methods: In 2010-2012, we applied a mixed mode survey to obtain annual, representative samples of US adults.

Results: In weighted analysis, lifetime prevalence of snus use (5.1% to 4.6%) did not significantly change from 2010 to 2012. Lifetime prevalence of water pipe increased from 8.8% to 11.9%, p < .05, and electronic cigarettes increased from 1.8% to 10.6%, p <.001. In 2012, daily smokers (44.6%) and nondaily smokers (27.1%) were the most likely to have tried electronic cigarettes, compared to former smokers (11.7%) and never smokers (2.4%). Ever use of electronic cigarettes also varied by age and education. In multivariable analysis, current daily (OR=43.0 , 95% CI = 28.7–64.6), nondaily (19.1, 11.0–33.2), and former smoking status (7.6, 5.1–11.4) remained significant, as did young (12.2, 6.0–24.9) and middle aged adults (10.0, 5.2-18.9).

Conclusion: Use of emerging tobacco products raises concerns about: a) nonsmokers' risk for nicotine dependence; b) current smokers maintaining their dependence; and c) the impact of poly tobacco use. Greater awareness of emerging tobacco product prevalence and the high risk demographic user groups will inform efforts to determine appropriate clinical approaches, public health policy, and regulatory actions.

INTRODUCTION

Recently, snus and electronic cigarettes have been introduced to the US market, while water pipes (hookah), especially in group social settings, have gained popularity. These products are often promoted as safer alternatives to traditional cigarettes and a potential way to decrease the harm caused by tobacco. However, people who may never have smoked a cigarette or who had been addicted to nicotine in the past may be enticed to use tobacco by these alternative products, posing an individual and public health risk. There is also the potential that current smokers may use these products as an alternative to cessation. In the absence of sufficient data and FDA (and state/local) regulation, the public health community needs more research on the population prevalence of use of these products. The purpose of this study is to assess three year trends in use of these emerging products among US adults. Results from this study can inform regulatory decisions about these products, and can guide clinical counseling efforts regarding the risks of any tobacco use.

METHODS

Cross-sectional dual-frame surveys representing national probability samples of adults were administered in 2010, 2011, and 2012. The design included a Random Digit Dialing (RDD) frame and an internet panel frame developed from a probability sample of U.S. adults, in order to reduce non-coverage issues arising from wireless substitution. The RDD frame included households with listed and unlisted landline telephones; five attempts were made to contact those selected adults who were not home. The Survey Research Laboratory at Mississippi State University's Social Science Research Center administered the surveys via computer-assisted telephone interviews to respondents in this frame. The probability-based panel frame included an online survey conducted by Knowledge Networks, administered to a randomly selected sample from a nationally representative research panel. This panel is based on a sampling frame which includes both listed and unlisted numbers, those without a landline telephone, and does not accept self-selected volunteers, and provides sample coverage for 99% of U.S. households. Data were weighted to adjust for age, race, gender, and region, as well as frame overlap among internet panel respondents who also had a landline telephone and were therefore also eligible for the RDD frame.

RESULTS//WEIGHTED SAMPLE CHARACTERISTICS

	2010 Unweighted N=3,240	2011 Unweighted N=3,097	2012 Unweighted N=3,101
Smoking Status			
Never Smoker	56.9%	56.9%	59.6%
Former Smoker	24.8%	25.0%	24.8%
Non-daily Smoker	4.6%	3.4%	3.8%
Daily Smoker	13.7%	14.7%	11.8%
Region			
Northeast	12.6%	12.9%	17.8%
Midwest	18.4%	18.9%	21.7%
South	37.6%	37.2%	37.5%
West	31.4%	31.0%	23.0%
Race			
White	74.2%	69.5%	71.5%
Black	11.5%	11.3%	11.4%
Other	14.3%	19.2%	17.1%
Age			
18-24	13.7%	9.3%	11.4%
25-44	38.8%	39.7%	38.3%
45-64	33.3%	34.9%	34.7%
65+	14.2%	16.1%	15.6%
Sex			
Male	47.6%	48.3%	48.1%
Female	52.4%	51.7%	51.9%
Education			
Less than HS	9.2%	10.5%	9.8%
High School	28.5%	27.3%	28.8%
Some College	29.3%	29.6%	28.1%
College Degree	33.0%	32.6%	33.4%

RESULTS//LIFETIME PREVALENCE OF USE OF EMERGING PRODUCTS, 2010-2012

	2010 %, (95% C.I.)	2011 %, (95% C.I.)	2012 %, (95% C.I.)
Snus	5.1% (4.3%, 5.9%)	7.1% (6.2%, 8.0%)	4.6% (3.9%, 5.3%)
Water Pipe	8.8% (7.8%, 9.8%)	9.3% (8.3%, 10.3%)	11.9% (10.8%, 13.0%)
Electronic Cigarette	1.8% (1.3%, 2.3%)	7.3% (6.4%, 8.2%)	10.6% (9.5%, 11.7%)

RESULTS//LIFETIME PREVALENCE OF USE OF ELECTRONIC CIGARETTES, 2010-2012

	2010 %, (95% C.I.)	2011 %, (95% C.I.)	2012 %, (95% C.I.)
Smoking Status			
Never Smoker	0.3% (0.0%0.6%)	1.2% (0.7%, 1.7%)	2.4% (1.7%, 3.1%)
Former Smoker	1.5% (0.7%, 2.3%)	6.5% (4.8%, 8.2%)	11.7% (9.5%, 13.9%)
Non-daily Smoker	8.2% (2.6%, 13.8%)	13.9% (6.5%, 21.3%)	27.1% (18.3%, 35.9%)
Daily Smoker	6.2% (4.0%, 8.4%)	30.9% (26.4%, 35.4%)	44.6% (39.3%, 49.9%)
Region			
Northeast	2.7% (1.4%, 4.0%)	4.8% (3.0%, 6.6%)	8.9% (6.5%, 11.3%)
Midwest	1.4% (0.6%, 2.2%)	7.8% (5.9%, 9.7%)	12.9% (10.5%, 15.3%)
South	1.6% (0.9%, 2.3%)	7.0% (5.5%, 8.5%)	10.0% (8.3%, 11.7%)
West	1.9% (0.8%, 3.0%)	8.2% (6.1%, 10.3%)	10.6% (8.2%, 13.0%)
Race			
White	1.7% (1.2%, 2.2%)	8.3% (7.2%, 9.4%)	12.3% (11.0%, 13.6%)
Black	1.9% (0.3%, 3.5%)	3.7% (1.7%, 5.7%)	5.3% (2.8%, 7.8%)
Other	1.8% (0.4%, 3.2%)	5.6% (3.4%, 7.8%)	7.3% (4.7%, 9.9%)
Age			
18-24	2.5% (0.6%, 4.4%)	7.3% (4.5%, 10.1%)	15.0% (9.9%, 20.1%)
25-44	2.1% (1.2%, 3.0%)	10.7% (8.4%, 13.0%)	13.9% (11.6%, 16.2%)
45-64	1.6% (0.9%, 2.3%)	4.9% (3.6%, 6.2%)	9.6% (7.9%, 11.3%)
65 +	0.4% (0.0%, 0.9%)	4.4% (3.1%, 5.7%)	2.3% (1.3%, 3.3%)
Sex			
Male	2.2% (1.4%, 3.0%)	8.8% (7.3%, 10.3%)	11.1% (9.4%, 12.8%)
Female	1.4% (0.9%, 1.9%)	5.8% (4.7%, 6.9%)	10.1% (8.7%, 11.5%)
Education			
Less than HS	0.7% (0.0%, 1.7%)	11.6% (7.8%, 15.4%)	8.5% (5.2%, 11.8%)
High School	1.7% (0.9%, 2.5%)	7.5% (5.8%, 9.2%)	14.0% (11.7%, 16.3%)
Some College	3.7% (2.4%, 5.0%)	8.3% (6.5%, 10.1%)	13.9% (11.6%, 16.2%)
College Degree	0.5% (0.1%, 0.9%)	4.8% (3.5%, 6.1%)	5.6% (4.3%, 6.9%)

RESULTS//MULTIVARIABLE ANALYSES

	O.R., 95% C.I. N=935 Electronic Cigarettes
Smoking Status	
Never Smoker	REF
Former Smoker	7.6 (5.1, 11.4)
Non-daily Smoker	19.1 (11.0, 33.2)
Daily Smoker	43.0 (28.7, 64.6)
Region	
Northeast	0.9 (0.6, 1.4)
Midwest	1.2 (0.8, 1.9)
South	0.8 (0.6, 1.2)
West	REF
Race	
White	2.4 (1.4, 4.2)
Black	REF
Other	1.9 (1.0, 3.6)
Age	
18-24	12.2 (6.0, 24.9)
25-44	10.0 (5.2, 18.9)
45-64	3.9 (2.0, 7.4)
65+	REF
Sex	
Male	1.0 (0.7, 1.3)
Female	REF
Education	
Less than HS	0.5 (0.3, 1.0)
High School	1.4 (1.0, 2.1)
Some College	1.6 (1.1, 2.4)
College Degree	REF

CONCLUSION

- Use of emerging tobacco products raises concerns about nonsmokers' risk for nicotine dependence, current smokers maintaining their dependence, and the impact of polytobacco use.
- Historically, smoking rates decreased due to health concerns, price increases, smoking policies, and the denormalization of tobacco use. Increased prevalence of electronic cigarette and waterpipe use raises concerns about the renormalization of tobacco use.
- The remarkable growth in the use of electronic cigarettes over the past three years raises is cause for concern. In an environment in which industry claims suggest low health risks for electronic cigarettes, regulatory and taxation action is very limited, and the products are aggressively marketed, federal, state, and local action is needed to protect public health and prevent the renormalization of tobacco use.
- Greater awareness of emerging tobacco product prevalence and the high risk demographic user groups will inform efforts to determine appropriate public health policy and regulatory action.
- Future research should address motivation for use of these products, as well as frequency and amount of use.
- Limitations
  - The dual frame methodology is designed to reduce the potential for sample bias associated with either RDD or internet panel samples alone, but we still can't eliminate the potential for noncoverage bias.
  - These data are self-report and cross-sectional, and we could not verify that responses concerning cigarette smoking and electronic cigarette use were not biased.

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