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Note: Video explaining the results is available at <http://youtu.be/9lpJO7j3k8U>

## **E-cigarettes surpass tobacco cigarettes among teens**

ANN ARBOR—In 2014, more teens use e-cigarettes than traditional, tobacco cigarettes or any other tobacco product—the first time a U.S. national study shows that teen use of e-cigarettes surpasses use of tobacco cigarettes.

These findings come from the University of Michigan's Monitoring the Future study, which tracks trends in substance use among students in 8th, 10th and 12th grades. Each year the national study, now in its 40th year, surveys 40,000 to 50,000 students in about 400 secondary schools throughout the United States.

"As one of the newest smoking-type products in recent years, e-cigarettes have made rapid inroads into the lives of American adolescents," said Richard Miech, a senior investigator of the study.

The survey asked students whether they had used an e-cigarette or a tobacco cigarette in the past 30 days. More than twice as many 8th- and 10th-graders reported using e-cigarettes as reported using tobacco cigarettes.

Specifically, 9 percent of 8th-graders reported using an e-cigarette in the past 30 days, while only 4 percent reported using a tobacco cigarette. In 10th grade, 16 percent reported using an e-cigarette and 7 percent reported using a tobacco cigarette. Among 12th-graders, 17 percent reported e-cigarette use and 14 percent reported use of a tobacco cigarette.

The older teens report less difference in use of e-cigarettes versus tobacco cigarettes.

"This could be a result of e-cigarettes being relatively new," said Lloyd Johnston, principal investigator of the project. "So today's 12th-graders may not have had the opportunity to begin using them when they were younger. Future surveys should be able to tell us if that is the case."

E-cigarettes are battery-powered devices with a heating element. They produce an aerosol, or vapor, that users inhale. Typically, this vapor contains nicotine, although the specific contents of the vapor are proprietary and are not regulated. The liquid that is vaporized in e-cigarettes comes in hundreds of flavors. Some of these flavors, such as bubble gum and milk chocolate cream, are likely attractive to younger teens.

E-cigarettes may serve as a point of entry into the use of nicotine, an addictive drug. The percentages of all youth in each grade who used e-cigarettes in the prior 30 days, but had never smoked a cigarette in their lives, ranged from 4 percent to 7 percent in 8th, 10th, and 12th grades.

For these youth, e-cigarettes are a primary source of nicotine and not a supplement to tobacco cigarette use. Whether youth who use e-cigarettes exclusively later go on to become tobacco cigarette smokers is yet to be determined by this study, and is of substantial concern to the public health community.

E-cigarette use among youth offsets a long-term decline in the use of tobacco cigarettes, which is at a historic low in the life of the study—now in its 40th year. In 2014, the prevalence of smoking tobacco cigarettes in the past 30 days was 8 percent for students in 8th, 10th and 12th grades combined. This is a significant decline from 10 percent in 2013, and is less than a third of the most recent high of 28 percent in 1998.

One important cause of the decline in smoking is that many fewer young people today have ever started to smoke tobacco cigarettes. In 2014, only 23 percent of students had ever tried tobacco cigarettes, as compared to 56 percent in 1998. Of particular concern is the possibility that e-cigarettes may lead to tobacco cigarette smoking, and reverse this hard-won, long-term decline.

"Part of the reason for the popularity of e-cigarettes is the perception among teens that they do not harm health," Miech said.

Only 15 percent of 8th-graders think there is a great risk of people harming themselves with regular use of e-cigarettes. This compares to 62 percent of 8th-graders who think there is a great risk of people harming themselves by smoking one or more packs of tobacco cigarettes a day. Because e-cigarettes are relatively new, a comprehensive assessment of their health impact—especially their long-term consequences—has yet to be developed.

Tables and figures associated with this release may be accessed at: <http://monitoringthefuture.org/data/data.html>

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Monitoring the Future has been funded under a series of competing, investigator-initiated research grants from the National Institute on Drug Abuse, one of the National Institutes of Health. The lead investigators, in addition to Lloyd Johnston, are Patrick O'Malley, Jerald Bachman, John Schulenberg, and most recently Richard Miech—all research professors at the University of Michigan's Institute for Social Research.

Surveys of nationally representative samples of American high school seniors were begun in 1975, making the class of 2014 the 40th such class surveyed. Surveys of 8th- and 10th-graders were added to the design in 1991, making the 2014 nationally representative samples the 24th such classes surveyed. The 2014 samples total 41,551 students located in 377 secondary schools. The samples are drawn separately at each grade level to be representative of students in that grade in public and private secondary schools across the coterminous United States.

The findings summarized here will be published in January in a forthcoming volume: Johnston, L. D., O'Malley, P. M., Miech, R.A., Bachman, J. G., & Schulenberg, J. E. (2015). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2014*. Ann Arbor, Mich.: Institute for Social Research, the University of Michigan. The content presented here is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

This year's findings on alcohol and illicit drug use are presented in a separate companion news release: <http://monitoringthefuture.org/press.html>