WY SAC ISSUE BRIEF

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This publication was supported by Tobacco Settlement Funds. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Wyoming Department of Health.

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2016

Electronic Nicotine Delivery Systems

Summary

The use of electronic nicotine delivery systems (ENDS; also known as electronic cigarettes, e-cigarettes, e-cigs, vape-pens, and other names) has increased in recent years (Abassi, 2016). Current youth use of ENDS nearly tripled between 2013 (4.5%) and 2014 (13.4%; Centers for Disease Control and Prevention [CDC], 2015b). In Wyoming, 30% of high school students were current ENDS users in 2015 (Youth Risk Behavior Surveillance System [YRBSS], 2015) and 20% of adults have tried ENDS (Wyoming Survey & Analysis Center [WYSAC], 2014).

Concern about whether the use of ENDS will lead to combustible tobacco use is of interest to many (Barrington-Trimis et al., 2016). Thus, the Wyoming Tobacco Prevention and Control Program (TPCP) is gathering data on behaviors related to and health consequences of ENDS use. This issue brief summarizes key findings from early research literature and provides preliminary data for Wyoming compared to the United States.

Background

ENDS are battery powered devices that produce a vapor by heating a liquid instead of producing smoke from burning tobacco. Contents of the liquid vary across products, and some models allow for customized liquids. Public health concerns about ENDS include questions about their safety, their potential role in the initiation of tobacco use, and their potential role in the cessation of tobacco use.

Research on the short-term health effects regarding use of ENDS, generally referred to as vaping, is limited, and long-term research has yet to be reported (Callahan-Lyon, 2014). Early findings suggest that using ENDS poses some cardiovascular risks (e.g., higher blood pressure and hardened arteries; Bhatnagar, 2016; Carnevale et al., 2016; Vlachopoulos et al. 2016).

Some ENDS users turn to vaping for help quitting traditional cigarettes (WYSAC, 2014) even though the U.S. Food and Drug Administration (FDA) has not approved ENDS as a cessation aid (FDA, 2013), and studies examining the efficacy of ENDS as a cessation aid have produced varying results. Generally, the results show low cessation rates, meaning ENDS are not highly successful cessation tools (Callahan-Lyon, 2014). Some researchers report that ENDS, as used presently, are not effective cessation aids and should not be promoted as such until data support this claim (Kalkhorn & Glantz, 2016). However, Abassi (2016) supports the use of ENDS as a cessation tool, after FDA-approved cessation aids have not worked. There is also significant product variability and a lack of consistent testing of products, both leading to varied findings (Callahan-Lyon, 2014).

Concern over whether secondhand ENDS vapors could lead to negative health consequences is of interest in public health (CDC, 2015a). The current research shows that ENDS used indoors could expose nonusers to nicotine and other chemicals, such as propylene glycol and vegetable glycerin. Though propylene glycol and vegetable glycerin are currently viewed as safe food additives, it is uncertain whether they cause health problems after repeated inhalation. Regarding nicotine exposure, additional research is needed to determine the effects of nicotine in secondhand vapor (Czogala et al., 2014). Use of ENDS in areas with smokefree indoor air policies may undermine the policies' effects by reversing social norms established against smoking or reducing the pressure to quit that these policies place on smokers (Fairchild, Bayer, & Colgrove, 2014; World Health Organization [WHO], 2014).

Presently, there is a lack of longitudinal studies indicating whether use of ENDS acts as a gateway to cigarettes. Wills, Sargent, Gibbons, Pagano, and Schweitzer (2016) provided evidence that ENDS use is a risk factor for smoking onset and could be enticing lower risk adolescents to start smoking.

Currently, the research is insufficient to draw firm conclusions regarding ENDS. Specifically, little research exists regarding the short- and long-term health consequences of ENDS. When research does exist, claims of inaccurate reporting, a lack of experimental studies, or

inconsistent testing can lead to incorrect or inadequate evidence (Abassi, 2016). The lack of consistent and adequate data suggests a need for further research to inform the public and decision-makers regarding risks, policy, regulations, and laws. As this research develops, in parallel with regulations on their use, it is important to monitor ENDS use among youth and adults.

Current Regulation

Two key laws in Wyoming address ENDS. Both are focused on children and youth. Senate File 103 was a bill introduced to the Wyoming Legislature on January 10, 2013, (and signed into law later that spring) to add "electronic cigarettes" to the definition of "tobacco products" in legislation designed to prevent the sale of tobacco products to minors. The bill defines electronic cigarettes as "a product that employs any mechanical heating element, battery or electronic circuit, regardless of shape or size, that can be used to deliver doses of nicotine vapor by means of heating a liquid nicotine solution contained in a cartridge or other delivery system" (State of Wyoming, 2013, p. 2).

House Bill 174 was introduced to the Wyoming Legislature on March 10, 2015, (and signed into law later that spring) requiring that "liquid nicotine products" be sold in child-resistant packaging to prevent accidental poisonings (State of Wyoming, 2015, p.1).

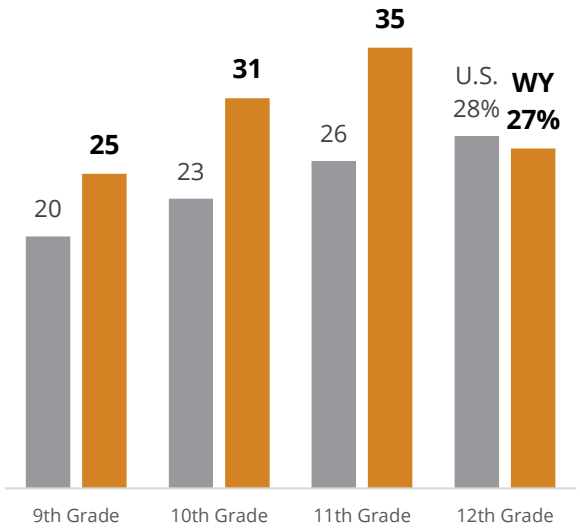
As of May 2016, the FDA considers ENDS to be tobacco products (FDA, 2016). Their regulations prohibiting the sale of ENDS to minors went into effect on August 8, 2016. FDA applies these regulations to any ENDS, regardless of the nicotine content.

Youth Use of ENDS

Youth use of ENDS is concerning because some research shows youth who have ever used ENDS are more likely to transition to use of combustible tobacco (Leventhal et al., 2015). Overall, nearly half (49%) of Wyoming high school students had ever used ENDS in 2015 (the first time the YRBSS included a question about ENDS), similar to the estimate of 45% nationwide. However, a greater percentage of Wyoming high school students (30%) were current ENDS users when

Figure 1: Current High School ENDS Use Varies by Grade

Use of ENDS in the 30 days before completing the survey



Source: YRBSS, 2015

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compared to the national estimate (24%). In Wyoming in 2015, ENDS use varied by grade with a non-linear pattern. In the United States for the same year, there was a clearer pattern of current use increasing with grade level (Figure 1; YRBSS, 2015).

Data from the National Youth Tobacco Survey (NYTS) show the use of tobacco products like cigarettes has decreased for middle and high school students, but this coincides with a rapid increase in ENDS use. Nationally, ENDS use by high school students increased from 2% in 2011 to 16% in 2015, becoming the most commonly used tobacco product in this age group (Singh, et al., 2016).

Adult Use of ENDS

In 2014, 20% of all Wyoming adults (18 or older) had tried ENDS at least once (WYSAC, 2014), compared to 13% nationally (Delnevo et al., 2016). Overall, 7% of Wyoming adults used ENDS daily or some days (WYSAC, 2014), compared to 4% nationally (Delnevo et al., 2016). The majority (66%) of Wyoming adults who reported ever trying ENDS said they tried them out of curiosity. Other common reasons for trying ENDS included using them in places where tobacco was not allowed and to replace, cut down, or quit other tobacco products (WYSAC, 2014).

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