



## Monitoring harm perceptions of smokeless tobacco products among U.S. adults: Health Information National Trends Survey 2012, 2014, 2015



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### HIGHLIGHTS

- A majority of adults do not think smokeless tobacco is less harmful than cigarettes.
- Believing smokeless tobacco is not less harmful than cigarettes declined from 2012–2015.
- Perceptions about the harm of smokeless tobacco differed by demographic subgroup.

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### ABSTRACT

**Introduction:** Changes to the U.S. smokeless tobacco landscape in recent years include a change to health warnings on packages, the implementation of bans in some stadiums, and the launch of a federal youth prevention campaign. It is unclear whether such changes have impacted consumer beliefs about smokeless tobacco. This study examines relative harm perceptions of smokeless tobacco compared to cigarettes among adults and assesses changes in smokeless tobacco harm perceptions over time.

**Methods:** We analyzed data from three cycles (2012, 2014, 2015) of the Health Information National Trends Survey (HINTS). Using 2015 data, we assessed bivariate associations between smokeless tobacco harm perceptions and tobacco use, beliefs, information seeking, and demographics. Using 2012, 2014, and 2015 data, we assessed whether smokeless tobacco harm perceptions changed over time within demographic groups using chi-square tests. We then used a weighted multinomial logistic regression to assess the association between smokeless tobacco perceptions and survey year, adjusting for covariates.

**Results:** When asked whether smokeless tobacco products are less harmful than cigarettes, the majority of respondents across cycles said “no.” The percent of respondents who selected this response option decreased over time. Findings showed significant differences in relative harm perceptions of smokeless tobacco versus cigarettes for specific demographic subgroups. Among subgroups, these shifts did not occur with a discernible pattern.

**Conclusions:** Understanding factors associated with perceptions of smokeless tobacco can inform tobacco control efforts. Additional monitoring of these trends may provide researchers with a deeper understanding of how and why smokeless tobacco harm perceptions change.

### 1. Introduction

The U.S. smokeless tobacco landscape has changed in recent years. From 2002–2012, self-reported cigarette use declined, while use of smokeless tobacco saw a slight but significant increase (3.5% in 2002 to 3.7% in 2012) (Agaku & Alpert, 2016). In 2009, the U.S. Food and Drug Administration (FDA) gained regulatory authority over the manufacture,

distribution and marketing of tobacco products, including smokeless tobacco products such as snuff and chewing tobacco (Public Law 111-31, 2009). Effective in 2010, Congress required manufacturers to display larger warning messages on smokeless tobacco packages (U.S. Food and Drug Administration, 2016), and in 2015, FDA authorized the marketing of eight new smokeless tobacco products, under the premarket tobacco application pathway, which requires FDA to consider the impact of

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marketing new tobacco products on the population as a whole (Food and Drug Administration, 2015). Several cities have recently banned smokeless tobacco use in baseball stadiums (Municipal Code of Chicago, n.d.; Admin. Code, n.d.; Mun. Code, n.d.; Los Angeles Municipal Code, n.d.). Additionally, in 2016, FDA launched the first federal campaign aimed at preventing smokeless tobacco use among youth living in rural areas (FDA, 2016). These changes have been accompanied by a debate among experts regarding whether smokeless tobacco products offer a “reduced harm” alternative to cigarettes (Hatsukami, Lemmonds, & Tomar, 2004; Savitz, Meyer, Tanzer, Mirvish, & Lewin, 2006). Some experts argue that smokeless tobacco use presents reduced health risks compared to cigarette use and, therefore, smokeless tobacco use should be promoted as an alternative to cigarette, while others argue that smokeless tobacco still presents health risks and, therefore, should not be promoted by public health officials (Gartner, Hall, Chapman, & Freeman, 2007; Hatsukami et al., 2004). The FDA has the authority to determine whether an individual product can be marketed as a modified risk tobacco product based on data submitted for the individual product. To make that determination, the FDA must use a population health perspective that considers the impact that such a determination would be likely to have, including “the increased or decreased likelihood that existing users of tobacco products will stop using such products” and “the increased or decreased likelihood that those who do not use tobacco products will start using such products.” (US Congress, n.d.). To date, FDA has not made a determination that any smokeless tobacco products are modified risk tobacco products. This question of reduced harm alternatives to cigarettes has intensified in recent years with the introduction of e-cigarettes onto the market (Munz, 2016; Carroll, 2016; Hajek, Etter, Benowitz, Eissenberg, & McRobbie, 2014; Institute of Medicine, 2001; Kozlowski, 2007, 2015; Zeller, 2013). It is unclear whether, in response to these marketing and regulatory changes, consumers have altered their beliefs about harms of smokeless tobacco.

Behavioral theories posit that harm perceptions predict health-related behaviors (Ajzen, 1985; Janz & Becker, 1984; Rosenstock, Strecher, & Becker, 1988) and, in the case of cigarette use, empirical evidence supports these theories (Cengelli, O’Loughlin, Lauzon, & Cornuz, 2012; Wellman, Dugas, Dutczak, et al., 2016). While research on the relationship between harm perceptions and smokeless tobacco use is limited, evidence from three studies suggests that the perception that smokeless tobacco use presents low risk is associated with smokeless tobacco use (Gansky, Ellison, Kavanagh, Isong, & Walsh, 2009; Kaufman, Mays, Koblitz, & Portnoy, 2014; Walsh, Ellison, Hilton, Chesney, & Ernster, 2000) (consistent with findings on risk perceptions among cigarette smokers (Slovic, 2001)). Additionally, research suggests that cigarette smokers are interested in using “reduced harm” tobacco products (Berg, Haardoerfer, Escoffery, Zheng, & Kegler, 2015; Parascandola, Augustson, O’Connell, & Marcus, 2009). Given the harms associated with smokeless tobacco use (U.S. Department of Health and Human Services, 2014; World Health Organization International Agency for Research on Cancer, 2007), it is important to further study smokeless tobacco perceptions.

Previous national surveys of U.S. adults, fielded between 2002 (O’Connor, Hyland, Giovino, Fong, & Cummings, 2005) to 2013 (Kaufman et al., 2014; Kiviniemi & Kozlowski, 2015), have found that less than a quarter of respondents believe smokeless tobacco is less harmful than cigarettes (Kaufman et al., 2014; Kiviniemi & Kozlowski, 2015; O’Connor et al., 2005, 2007; Popova & Ling, 2013; Regan, Dube, & Arrazola, 2012). To our knowledge, few national adult surveys have assessed correlates of relative harm perceptions of smokeless tobacco compared to cigarettes. A 2013 survey found that adults who perceived snus to be less harmful and addictive than cigarettes were more likely to have used snus compared to respondents who believed snus was at least as harmful and addictive as cigarettes (Kaufman et al., 2014). A 2012–2013 survey of U.S. adults found no differences in relative harm perceptions of smokeless tobacco compared to cigarettes by smoking status (Kiviniemi & Kozlowski, 2015). The 2003 International Tobacco Control Policy Four-Country Survey, fielded among U.S. adult cigarette smokers, found that men, younger adults, and those who

reported thinking about the harms of smoking recently were likely to believe smokeless tobacco was less harmful than smoking (O’Connor et al., 2005).

The current study examined relative harm perceptions of smokeless tobacco compared to traditional cigarettes in a nationally representative sample of U.S. adults, differences in perceptions by demographic characteristics and other factors (addiction beliefs, cancer beliefs and information seeking behaviors), and whether the prevalence of harm perceptions differs across three time points among the overall sample and subgroups. We looked at differences in perceptions by subgroup because previous research has shown that harm perceptions of smokeless tobacco differ by demographic and tobacco use subgroups (O’Connor et al., 2005). By increasing our understanding of the public’s perceptions about these products and how perceptions are have changed in recent years, our findings may help inform public health communications aimed at reducing tobacco-related harms. Additionally, understanding consumer perceptions of tobacco products plays an important role in FDA’s regulatory work. For example, FDA has published draft guidance (U.S. Food and Drug Administration, n.d.) explaining the usefulness of data on consumer perceptions of tobacco products in informing FDA decision-making related to the marketing of modified risk tobacco products which, when finalized, will represent the agency’s current thinking on this issue.

## 2. Methods

### 2.1. Data

Data were drawn from three cycles of the Health Information National Trends Survey (HINTS). HINTS is a nationally representative, cross-sectional, mail-based survey of civilian, non-institutionalized adults aged 18+. HINTS data are publicly available (National Cancer Institute, n.d.). We used data from HINTS 4 Cycle 2 collected October 2012–January 2013 with a 40% response rate (N = 3,630); HINTS 4 Cycle 4 data collected August–November 2014 with a 34% response rate (N = 3,677); and the 2015 cycle, referred to as HINTS-FDA 2015, collected May–September 2015 with a 33% response rate (N = 3,738). Methods for HINTS-FDA 2015 are described elsewhere (Blake, Portnoy, Kaufman, et al., in press). All cycles were approved by the Office of Management and Budget and deemed exempt by the National Institute of Health Office of Human Subjects Research.

### 2.2. Measures

All three HINTS cycles included harm perceptions and demographic measures. Use of cigarettes, cigars, and smokeless tobacco; addiction beliefs; and information seeking were only measured in 2015. While the cancer belief construct was measured in all three cycles, the questions used to measure this construct changed in 2015; thus, we included cancer beliefs only in the analysis of 2015 data.

#### 2.2.1. Harm perceptions

The primary dependent variable was relative harm perceptions of smokeless tobacco use compared to cigarette smoking. Respondents were asked, “In your opinion, do you think that some smokeless tobacco products, such as chewing tobacco, snus and snuff are less harmful to a person’s health than cigarettes?” Response options were “Yes,” “No,” and “Don’t know.”

#### 2.2.2. Use of cigarettes, cigars, and smokeless tobacco

Respondents were asked if they had smoked at least 100 cigarettes in their lifetime and if they now use cigarettes “Every day,” “Some days,” or “Not at all.” Items assessed the number of cigars, cigarillos, or little filtered cigars smoked in the respondent’s lifetime and current use. Respondents were asked if they had used chewing tobacco, snus, snuff, or dip at least 20 times in their lifetime and if they currently use

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