



Point-of-sale cigarette purchase patterns among U.S. adult smokers—National Adult Tobacco Survey, 2012–2014



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ABSTRACT

Tobacco products are ubiquitous in most U.S. retail environments. Given that data on preferred point-of-sale purchase locations among U.S. adult tobacco users are limited, an enhanced understanding of tobacco purchase locations can help inform tobacco control policy, planning, and practice. We investigated prevalence and sociodemographic characteristics associated with cigarette purchase location among U.S. adult smokers. Pooled data came from the 2012–2013 (N = 60,192) and 2013–2014 (N = 75,233) National Adult Tobacco Surveys. Current cigarette smokers (n = 18,005) aged ≥ 18 were asked if they purchased cigarettes within the previous 30 days (n = 15,182) and, if so, where they last purchased cigarettes. In 2016, logistic regression adjusted for sex, age, race/ethnicity, education level and annual household income was used to assess characteristics associated with purchase location. Among current smokers, 90.2% reported purchasing cigarettes in the past 30 days. The most common purchase locations were convenience stores/gas stations (69.1%), tobacco discount stores (9.9%), drug stores (5.0%), supermarkets (4.9%), and liquor stores (3.6%). The odds of purchasing cigarettes at convenience stores/gas stations were higher among men (adjusted odds ratio (AOR) = 1.4; 95% confidence interval (CI) = 1.2–1.5) than women; and among adults aged 18–24 (AOR = 3.1; 95% CI = 2.4–3.9), 25–44 (AOR = 3.1; 95% CI = 2.7–3.7), and 45–64 years (AOR = 1.8 95% CI = 1.6–2.1) than adults aged ≥ 65 years. Over two-thirds of U.S. smokers last purchased cigarettes from convenience stores/gas stations. Understanding the relationship between purchase location and smoker characteristics may inform tobacco control strategies in the retail environment.

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1. Introduction

Tobacco use causes significant disease and death in the U.S., with cigarette smoking alone causing about 480,000 premature deaths annually (U.S. Department of Health and Human Services, 2014). Tobacco products are ubiquitous in places where people shop for everyday items, including gasoline, food, alcohol, and medicine, and places where tobacco products are available to consumers represent an important environment for tobacco prevention and control interventions. Moreover, while tobacco point-of-sale purchase locations vary, tobacco industry advertising and marketing also differ depending on where tobacco products are sold (Henriksen, 2015). Minimizing how and where tobacco products are sold has emerged as a core tobacco control strategy, coupled with proven population-based interventions: raising cigarette

excise taxes, establishing smoke-free air policies, encouraging cessation and developing counter-marketing campaigns (ChangeLabSolutions, 2016).

Accordingly, the retail environment is an important area for tobacco control policy interventions (Chapman and Freeman, 2009). As part of the blueprint to reduce tobacco use, the Institute of Medicine recommended that tobacco outlets be licensed, monitored and restricted (Institute of Medicine, 2007). Some U.S.-based retailers have voluntarily stopped selling tobacco; for example, the retailers Target and CVS stopped selling tobacco products in 1996 and 2014, respectively. Additionally, other smaller retailers and independent pharmacies have done the same (McDaniel and Malone, 2014).

With a growing interest in public health policies to regulate the U.S. tobacco retail environment, it is important to have an enhanced understanding of tobacco purchase locations among smokers. Additionally, tobacco retailers and places where tobacco products are sold are disproportionately located in neighborhoods with low income and racial/ethnic minority persons (Rodriguez et al., 2012); identifying

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sociodemographic variations in tobacco products sales can be helpful for informing strategies to address longstanding disparities in tobacco use (Hill et al., 2014; Chapman and Freeman, 2009; Myers et al., 2015).

However, recent data on preferred point-of-sale purchase locations among U.S. adult tobacco users is limited. Cornelius et al. (2014) reported on a range of tobacco outlets used by U.S. adult smokers by a limited number of sociodemographic characteristics. Moreover, Golden and colleagues (Golden et al., 2016) reported differences in where cigarettes are purchased on and off Indian reservations by racial/ethnic groups, but did not assess other purchase locations. To address this gap in the literature, this study used recent data from the National Adult Tobacco Survey (NATS) to assess patterns of cigarette purchase by retail locations and sociodemographics among a nationally representative sample of U.S. adults.

2. Methods

2.1. Data source

Data were pooled from the 2012–2013 (N = 60,192) and 2013–2014 (N = 75,233) NATS, a landline and cellular telephone survey of U.S. adults aged ≥ 18 years (Centers for Disease Control and Prevention, 2016). The 2012–2013 and 2013–2014 NATS were intended to produce a nationally representative sample; both surveys were sampled and weighted in a manner to provide nationally representative estimates for the assessed indicators and a complete description of NATS methodology is available elsewhere [http://www.cdc.gov/tobacco/data_statistics/surveys/nats/]. Overall response rates were 36.3% and 36.1%, respectively.

2.2. Measures

2.2.1. Current tobacco use

Current cigarette smokers were respondents who reported smoking ≥ 100 cigarettes during their lifetime and who smoked ‘every day’ or ‘some days’ at the time of survey. Average number of cigarettes smoked per day (CPD) among current cigarette smokers in the past 30 days was categorized as 1–9; 10–19; 20–29; or > 30 CPD.

Current cigarette smokers were further classified as exclusive cigarette smokers or concurrent users of cigarettes and ≥ 1 other tobacco product (cigars/cigarillos/filtered little cigars, regular pipes, water pipes/hookahs, chewing tobacco/snuff/dip, snus, dissolvable tobacco products, and electronic cigarettes).

2.2.2. Purchase location

Current cigarette smokers who purchased cigarettes in the past 30 days were asked to select the location of their *last* purchase from the following mutually exclusive response options: ‘at a convenience store or gas station’; ‘at a supermarket’; ‘at a liquor store’; ‘at a drug store’; ‘at a tobacco discount store’; ‘at another discount store, such as Wal-Mart or Costco’; ‘on an Indian reservation’; ‘from a vending machine’; ‘on the Internet’; ‘from another person’; or ‘other’. Because of small sample sizes, ‘vending machine’, ‘from another person’, and ‘other’ were collapsed into a single ‘other’ category. Internet sales were not included in the analysis because these sales are illegal.

2.2.3. Sociodemographics

Sociodemographic characteristics included: sex, age, race/ethnicity, education, annual household income, and U.S. region.

2.2.4. Analysis

Data were weighted to yield nationally representative estimates. Prevalence for point-of-sale purchase locations was calculated overall and by sociodemographics and tobacco use characteristics. Multivariable logistic regression was used to assess characteristics associated with purchase location, including sex, age, race/ethnicity, education,

annual household income, U.S. census region, and current tobacco use. Separate logistic regression models were constructed to predict cigarette purchase in the past 30 days among each respective location category (i.e., convenience store or gas station, supermarket, liquor store, drug store, tobacco discount store, another discount store such as Wal-Mart or Costco, Indian reservation, or other), each of which adjusted for sex, age, race/ethnicity, education level and annual household income. Data were analyzed using SAS-callable SUDAAN (version 10).

3. Results

Overall, 90.2% of current cigarette smokers reported purchasing cigarettes for themselves in the past 30 days (Table 1). A large proportion (91.5%) of non-Hispanic whites purchased cigarettes for themselves and a lower proportion (84.2%) of Hispanics purchased cigarettes for themselves. The most common locations for last purchase were: convenience stores/gas stations (69.1%), tobacco discount stores (9.9%), drug stores (5.0%), supermarkets (4.9%), and liquor stores (3.6%) (Table 2).

3.1. Convenience store/gas stations

The odds of purchasing cigarettes at convenience stores/gas stations were significantly ($p < 0.05$) higher among men (adjusted odds ratio [AOR] = 1.4) compared to women; among persons aged 18–24 (AOR = 3.1), 25–44 (AOR = 3.1) and 45–64 years (AOR = 1.8) compared to persons aged ≥ 65 years; among those with General Education Diploma (GED) (AOR = 1.5) compared to those with a college or higher degree; and among those residing in the Northeast (AOR = 2.0), Midwest (AOR = 2.0) and South (AOR = 2.0) compared to the West ($p < 0.05$). Conversely, Hispanics (AOR = 0.8) and non-Hispanic other races (AOR = 0.8) had lower odds of purchasing cigarettes at convenience stores/gas stations compared to non-Hispanic whites (Table 2).

3.2. Supermarkets

The odds of purchasing cigarettes at supermarkets were lower among adults aged 18–24 (AOR = 0.3), 25–44 (AOR = 0.4), and 45–64 years (AOR = 0.5) compared to adults aged ≥ 65 years (Table 2).

3.3. Liquor stores

The odds of purchasing cigarettes at liquor stores were higher among non-Hispanic blacks (AOR = 2.5), non-Hispanic other races (AOR = 2.4), and Hispanics (AOR = 3.4) compared to non-Hispanic whites. Conversely, the odds were lower among current smokers who smoked 10–19 CPD (AOR = 0.6) and 20–29 CPD (AOR = 0.4) compared to 1–9 CPD; as well as among adults residing in the Northeast (AOR = 0.2), Midwest (AOR = 0.4), and South (AOR = 0.2) compared to those in the West (Table 2).

3.4. Drug stores

The odds of purchasing cigarettes at drug stores were higher among Hispanics (AOR = 1.6) compared to non-Hispanic whites. Odds were lower among men (AOR = 0.6) compared to women; among adults aged 18–24 (AOR = 0.4), 25–44 (AOR = 0.5), and 45–64 years (AOR = 0.6) compared to adults aged ≥ 65 years; among those with a GED (AOR = 0.4), high school diploma (AOR = 0.6) and associate degree and/or some college (AOR = 0.7) compared to those with a college degree or higher; and among those with incomes of $< \$20,000$ (AOR = 0.6) compared to those earning $\geq \$100,000$ (Table 2).

3.5. Tobacco discount stores

Those with annual household incomes of $< \$20,000$ (AOR = 1.6) had higher odds of purchasing cigarettes at tobacco discount stores

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