



Short Communication

Rules to prohibit the use of electronic vapor products inside homes and personal vehicles among adults in the U.S., 2017



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ABSTRACT

Most U.S. adults have voluntary rules prohibiting the use of smoked tobacco products in their homes and vehicles. However, the prevalence of similar rules for electronic vapor products (EVPs) is uncertain. This study assessed the prevalence and correlates of rules prohibiting EVP use inside homes and vehicles. Data from a 2017 Internet-based panel survey of U.S. adults aged ≥ 18 years ($n = 4107$) were analyzed. For homes and vehicles, prevalence of reporting that EVP use was not allowed, partially allowed, fully allowed, or unknown was assessed overall and by covariates. Correlates of prohibiting EVP use was assessed by multivariable logistic regression. In homes, 58.6% of adults did not allow EVP use, 7.7% partially allowed use, 10.1% fully allowed use, and 23.6% were unsure of the rules. In vehicles, 63.8% of respondents did not allow EVP use, 6.0% partially allowed use, 8.9% fully allowed use, and 21.4% were unsure of the rules. Following multivariable adjustment, prohibiting EVP use inside homes and vehicles was more likely among respondents with higher income and education, and with a child aged < 18 years. Users of EVPs and other tobacco products, and respondents living with users of EVPs and other tobacco products, were less likely to prohibit EVP use in these locations. These findings show that about 6 in 10 U.S. adults have rules prohibiting EVP use inside homes and vehicles, but variations exist by population subgroups. Voluntary smoke-free rules in homes and vehicles that include EVPs can help protect children and non-users from secondhand EVP aerosol exposure.

1. Introduction

The health effects of combustible tobacco product use and secondhand smoke (SHS) exposure are well established (U.S. Department of Health and Human Services, 2014). Over the past several decades, significant progress has occurred in the adoption of comprehensive smoke-free policies in indoor public places, including worksites, restaurants, and bars (Centers for Disease Control and Prevention, 2017). Public indoor smoke-free policies are strongly associated with the adoption of voluntary smoke-free rules in private settings such as homes and vehicles (Cheng et al., 2015). Accordingly, the prevalence of voluntary smoke-free home (83.7%) and vehicle (78.1%) rules has also increased among U.S. adults over time (Kruger et al., 2015).

In recent years, the tobacco product landscape has evolved to include a variety of newer products, including e-cigarettes and other electronic vapor products (EVPs) (U.S. Department of Health and Human Services, 2016). In contrast to combustible tobacco products, EVPs do not produce sidestream emissions. Aerosol is only produced during activation of the device, some of which is exhaled into the

environment as secondhand aerosol (SHA) where nonusers can be exposed (USDHHS, 2016). Although these products generally emit fewer toxicants than combustible tobacco products (USDHHS, 2016), SHA exposure can involuntarily expose nonusers, including children, to harmful and potentially harmful constituents such as nicotine, ultrafine particulates and volatile organic compounds, among others (USDHHS, 2016).

Few studies have assessed voluntary rules prohibiting EVP use in homes and vehicles (Berg et al., 2014; Kolar et al., 2014; Brose et al., 2017). In the U.S., two small, non-nationally representative studies reported that 6% of current cigarette smokers (Berg et al., 2014), and 32% of current and former smokers (Kolar et al., 2014), had rules prohibiting EVP use in their home; no current smokers reported having rules against EVP use in their vehicles (Berg et al., 2014). To date, only one study has assessed EVP rules in homes among tobacco product users and non-users (Brose et al., 2017). This nationally-representative study, conducted in Great Britain, reported that 57.5% of adults did not allow EVP use inside their homes, but did not report on rules inside vehicles (Brose et al., 2017).

Abbreviations: EVP, electronic vapor product; SHA, secondhand aerosol; SHS, secondhand smoke; aPR, adjusted prevalence ratio; CI, confidence interval

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Table 1 Prevalence of having rules regarding the use of electronic vapor products inside homes and vehicles by demographic characteristic and tobacco product use among adults, *Summer Styles Survey – United States, 2017*.

	Rules inside homes ^a						Rules inside vehicles ^b									
	Not allowed		Partially allowed		Fully allowed		Don't Know, Not Sure		Not allowed		Partially allowed		Fully allowed		Don't Know, Not Sure	
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	
Overall	58.6 (56.9–60.3)	7.7 (6.8–8.7)	10.1 (9.1–11.2)	23.6 (22.1–25.1)	63.8 (62.0–65.4)	6.0 (5.2–6.9)	8.9 (8.0–10.0)	21.4 (19.9–22.9)	54.8 (52.2–59.3) ^c	9.1 (7.7–10.8)	11.0 (9.5–12.7)	25.1 (22.9–27.4)	60.9 (58.3–63.4) ^c	5.7 (4.7–7.0)	10.6 (9.1–12.3)	22.7 (20.6–25.1)
Sex																
Male	62.2 (59.9–64.5)	8.6 (5.7–12.9)	10.5 (7.1–15.1)	22.2 (17.4–27.9)	59.0 (52.6–65.2) ^c	9.5 (6.4–13.9)	9.6 (6.4–14.0)	21.9 (17.0–27.7)	62.2 (59.9–64.5)	6.5 (5.4–7.7)	9.2 (7.9–10.7)	22.1 (20.2–24.2)	66.4 (64.1–68.6)	6.2 (5.1–7.5)	7.3 (6.2–8.7)	20.1 (18.2–22.1)
Female	58.7 (52.3–64.9) ^c	9.5 (7.9–11.4)	11.0 (9.2–13.0)	25.5 (22.9–28.2)	59.4 (56.3–62.3)	7.1 (5.7–8.7)	10.2 (8.5–12.3)	23.3 (20.7–26.1)	54.0 (51.0–57.0)	7.3 (6.0–8.9)	10.8 (9.2–12.6)	21.4 (19.3–23.7)	65.5 (62.9–68.0)	5.6 (4.5–7.0)	9.4 (7.9–11.1)	19.5 (17.4–21.7)
Age																
18–24	60.4 (57.8–63.0)	4.8 (3.4–6.8)	7.0 (5.3–9.2)	24.8 (21.5–28.4)	71.2 (67.5–74.6)	2.5 (1.6–4.0)	5.4 (3.8–7.4)	21.0 (17.9–24.4)	60.4 (57.8–63.0)	7.7 (4.8–12.4)	11.1 (9.9–12.5)	19.8 (18.3–21.4)	66.4 (64.5–68.3) ^c	6.5 (5.5–7.6)	9.6 (8.4–10.9)	17.5 (16.0–19.1)
25–44	63.4 (59.6–67.1)	7.7 (6.7–8.9)	8.3 (5.7–11.8)	39.2 (33.8–44.8)	53.8 (48.1–59.4)	6.4 (4.5–9.1)	7.8 (5.2–11.4)	34.7 (29.4–40.4)	63.4 (59.6–67.1)	7.1 (4.6–10.8)	8.3 (5.7–11.8)	39.2 (33.8–44.8)	53.8 (48.1–59.4)	6.4 (4.5–9.1)	7.8 (5.2–11.4)	34.7 (29.4–40.4)
45–64	61.3 (59.4–63.3) ^c	7.1 (4.6–10.8)	8.4 (6.1–11.6)	28.8 (24.6–33.5)	58.7 (53.6–63.5)	6.7 (5.9–7.3)	8.5 (6.1–11.8)	34.7 (29.4–40.4)	61.3 (59.4–63.3) ^c	7.7 (4.8–12.4)	7.7 (4.8–12.4)	20.7 (15.4–27.4)	66.7 (59.4–73.3)	5.9 (3.3–10.3)	5.9 (3.3–10.3)	22.9 (17.2–29.8)
65+	45.5 (40.0–51.1)	10.2 (8.4–12.3)	12.3 (10.3–14.6)	15.6 (13.5–17.8)	75.5 (72.8–78.0)	4.5 (3.4–6.0)	4.9 (3.8–6.3)	15.1 (13.1–17.5)	45.5 (40.0–51.1)	8.4 (5.4–12.7)	13.8 (9.9–18.9)	36.3 (30.2–42.9)	46.6 (39.8–53.4) ^c	5.9 (3.5–9.7)	12.0 (8.3–17.1)	35.5 (29.2–42.4)
Race																
White, Non-Hispanic	51.0 (47.9–54.0)	8.4 (6.1–11.6)	10.6 (8.9–12.5)	28.3 (25.6–31.1)	57.7 (54.6–60.7)	6.6 (5.2–8.3)	10.2 (8.5–12.2)	25.5 (22.9–28.3)	51.0 (47.9–54.0)	8.4 (6.1–11.6)	10.6 (8.9–12.5)	28.3 (25.6–31.1)	57.7 (54.6–60.7)	6.6 (5.2–8.3)	10.2 (8.5–12.2)	25.5 (22.9–28.3)
Black, Non-Hispanic	58.0 (54.9–61.1)	5.5 (4.3–7.0)	6.2 (4.9–7.8)	15.6 (13.5–17.8)	75.5 (72.8–78.0)	4.5 (3.4–6.0)	4.9 (3.8–6.3)	15.1 (13.1–17.5)	58.0 (54.9–61.1)	7.5 (6.0–9.3)	12.3 (10.3–14.6)	22.2 (19.7–24.9)	63.8 (60.6–66.8)	7.0 (5.5–8.8)	10.8 (9.0–13.0)	18.4 (16.1–21.0)
Hispanic	72.8 (70.1–75.3)	8.0 (6.4–9.9)	9.2 (7.4–11.3)	20.2 (17.8–22.8)	67.2 (64.2–70.1) ^c	7.1 (5.7–8.9)	7.4 (5.9–9.3)	18.2 (15.9–20.9)	72.8 (70.1–75.3)	8.0 (6.4–9.9)	9.2 (7.4–11.3)	20.2 (17.8–22.8)	67.2 (64.2–70.1) ^c	7.1 (5.7–8.9)	7.4 (5.9–9.3)	18.2 (15.9–20.9)
Other, Non-Hispanic	62.7 (59.6–65.6) ^c	7.6 (6.6–8.9)	10.5 (9.3–11.8)	24.8 (23.0–26.7)	62.4 (60.3–64.4)	5.6 (4.7–6.6)	9.5 (8.3–10.8)	22.6 (20.8–24.4)	62.7 (59.6–65.6) ^c	7.6 (6.6–8.9)	10.5 (9.3–11.8)	24.8 (23.0–26.7)	62.4 (60.3–64.4)	5.6 (4.7–6.6)	9.5 (8.3–10.8)	22.6 (20.8–24.4)
Education																
< High school	63.0 (61.2–64.9) ^c	5.8 (5.0–6.9)	6.4 (5.5–7.4)	24.7 (23.1–26.4)	68.7 (66.8–70.4) ^c	3.8 (3.2–4.6)	5.5 (4.7–6.5)	22.0 (20.4–23.7)	63.0 (61.2–64.9) ^c	5.8 (5.0–6.9)	6.4 (5.5–7.4)	24.7 (23.1–26.4)	68.7 (66.8–70.4) ^c	3.8 (3.2–4.6)	5.5 (4.7–6.5)	22.0 (20.4–23.7)
High school	38.5 (33.5–43.7)	16.0 (12.7–20.0)	26.3 (22.1–30.9)	19.3 (15.4–23.8)	41.3 (36.3–46.6)	16.6 (13.0–20.9)	24.4 (20.3–29.1)	17.6 (14.0–22.0)	38.5 (33.5–43.7)	16.0 (12.7–20.0)	26.3 (22.1–30.9)	19.3 (15.4–23.8)	41.3 (36.3–46.6)	16.6 (13.0–20.9)	24.4 (20.3–29.1)	17.6 (14.0–22.0)
Some college	21.6 (14.3–31.3)	20.7 (14.0–29.4)	49.5 (39.5–59.5)	20.7 (15.4–27.4)	20.6 (13.7–29.8)	22.5 (15.1–32.2)	44.5 (34.8–54.8)	15.1 (13.1–17.5)	21.6 (14.3–31.3)	20.7 (14.0–29.4)	49.5 (39.5–59.5)	20.7 (15.4–27.4)	20.6 (13.7–29.8)	22.5 (15.1–32.2)	44.5 (34.8–54.8)	15.1 (13.1–17.5)
College degree	67.5 (65.3–69.7) ^c	6.0 (5.0–7.2)	5.7 (4.7–6.9)	20.7 (18.9–22.6)	72.8 (70.7–74.9) ^c	3.7 (2.9–4.7)	4.6 (3.7–5.7)	18.9 (17.1–20.8)	67.5 (65.3–69.7) ^c	6.0 (5.0–7.2)	5.7 (4.7–6.9)	20.7 (18.9–22.6)	72.8 (70.7–74.9) ^c	3.7 (2.9–4.7)	4.6 (3.7–5.7)	18.9 (17.1–20.8)
Respondent has child < 18 years	57.4 (54.1–60.7)	7.8 (6.1–9.9)	12.2 (10.1–14.6)	22.6 (19.9–25.6)	64.4 (61.0–67.6)	4.8 (3.6–6.5)	11.8 (9.6–14.3)	19.0 (16.4–21.9)	57.4 (54.1–60.7)	7.8 (6.1–9.9)	12.2 (10.1–14.6)	22.6 (19.9–25.6)	64.4 (61.0–67.6)	4.8 (3.6–6.5)	11.8 (9.6–14.3)	19.0 (16.4–21.9)
Yes	30.1 (23.8–34.7)	16.8 (13.5–20.8)	26.5 (22.5–30.9)	26.7 (22.5–31.3)	30.7 (26.4–35.5)	19.1 (15.6–23.3)	24.5 (20.6–28.9)	25.6 (21.4–30.3)	30.1 (23.8–34.7)	16.8 (13.5–20.8)	26.5 (22.5–30.9)	26.7 (22.5–31.3)	30.7 (26.4–35.5)	19.1 (15.6–23.3)	24.5 (20.6–28.9)	25.6 (21.4–30.3)
No	59.7 (57.9–61.4) ^c	7.0 (6.2–8.0)	9.8 (8.8–11.0)	23.4 (21.9–25.0)	64.9 (63.1–66.6) ^c	5.5 (4.7–6.3)	8.4 (7.5–9.5)	21.2 (19.7–22.8)	59.7 (57.9–61.4) ^c	7.0 (6.2–8.0)	9.8 (8.8–11.0)	23.4 (21.9–25.0)	64.9 (63.1–66.6) ^c	5.5 (4.7–6.3)	8.4 (7.5–9.5)	21.2 (19.7–22.8)
EVP use status ^e	43.0 (34.9–51.5)	18.8 (12.8–26.8)	14.2 (9.4–20.8)	24.0 (17.5–31.9)	45.8 (37.5–54.4)	14.9 (9.6–22.3)	18.1 (12.3–25.8)	21.2 (14.9–29.3)	43.0 (34.9–51.5)	18.8 (12.8–26.8)	14.2 (9.4–20.8)	24.0 (17.5–31.9)	45.8 (37.5–54.4)	14.9 (9.6–22.3)	18.1 (12.3–25.8)	21.2 (14.9–29.3)
Never user	63.0 (61.2–64.9) ^c	5.8 (5.0–6.9)	6.4 (5.5–7.4)	24.7 (23.1–26.4)	68.7 (66.8–70.4) ^c	3.8 (3.2–4.6)	5.5 (4.7–6.5)	22.0 (20.4–23.7)	63.0 (61.2–64.9) ^c	5.8 (5.0–6.9)	6.4 (5.5–7.4)	24.7 (23.1–26.4)	68.7 (66.8–70.4) ^c	3.8 (3.2–4.6)	5.5 (4.7–6.5)	22.0 (20.4–23.7)
Tried, not current user	38.5 (33.5–43.7)	16.0 (12.7–20.0)	26.3 (22.1–30.9)	19.3 (15.4–23.8)	41.3 (36.3–46.6)	16.6 (13.0–20.9)	24.4 (20.3–29.1)	17.6 (14.0–22.0)	38.5 (33.5–43.7)	16.0 (12.7–20.0)	26.3 (22.1–30.9)	19.3 (15.4–23.8)	41.3 (36.3–46.6)	16.6 (13.0–20.9)	24.4 (20.3–29.1)	17.6 (14.0–22.0)
Current user	21.6 (14.3–31.3)	20.7 (14.0–29.4)	49.5 (39.5–59.5)	20.7 (15.4–27.4)	20.6 (13.7–29.8)	22.5 (15.1–32.2)	44.5 (34.8–54.8)	15.1 (13.1–17.5)	21.6 (14.3–31.3)	20.7 (14.0–29.4)	49.5 (39.5–59.5)	20.7 (15.4–27.4)	20.6 (13.7–29.8)	22.5 (15.1–32.2)	44.5 (34.8–54.8)	15.1 (13.1–17.5)
Cigarette smoking status ^f																
Never smoker	67.5 (65.3–69.7) ^c	6.0 (5.0–7.2)	5.7 (4.7–6.9)	20.7 (18.9–22.6)	72.8 (70.7–74.9) ^c	3.7 (2.9–4.7)	4.6 (3.7–5.7)	18.9 (17.1–20.8)	67.5 (65.3–69.7) ^c	6.0 (5.0–7.2)	5.7 (4.7–6.9)	20.7 (18.9–22.6)	72.8 (70.7–74.9) ^c	3.7 (2.9–4.7)	4.6 (3.7–5.7)	18.9 (17.1–20.8)
Former smoker	57.4 (54.1–60.7)	7.8 (6.1–9.9)	12.2 (10.1–14.6)	22.6 (19.9–25.6)	64.4 (61.0–67.6)	4.8 (3.6–6.5)	11.8 (9.6–14.3)	19.0 (16.4–21.9)	57.4 (54.1–60.7)	7.8 (6.1–9.9)	12.2 (10.1–14.6)	22.6 (19.9–25.6)	64.4 (61.0–67.6)	4.8 (3.6–6.5)	11.8 (9.6–14.3)	19.0 (16.4–21.9)
Current smoker	30.1 (23.8–34.7)	16.8 (13.5–20.8)	26.5 (22.5–30.9)	26.7 (22.5–31.3)	30.7 (26.4–35.5)	19.1 (15.6–23.3)	24.5 (20.6–28.9)	25.6 (21.4–30.3)	30.1 (23.8–34.7)	16.8 (13.5–20.8)	26.5 (22.5–30.9)	26.7 (22.5–31.3)	30.7 (26.4–35.5)	19.1 (15.6–23.3)	24.5 (20.6–28.9)	25.6 (21.4–30.3)
Other tobacco product use ^g																
Non-current user	59.7 (57.9–61.4) ^c	7.0 (6.2–8.0)	9.8 (8.8–11.0)	23.4 (21.9–25.0)	64.9 (63.1–66.6) ^c	5.5 (4.7–6.3)	8.4 (7.5–9.5)	21.2 (19.7–22.8)	59.7 (57.9–61.4) ^c	7.0 (6.2–8.0)	9.8 (8.8–11.0)	23.4 (21.9–25.0)	64.9 (63.1–66.6) ^c	5.5 (4.7–6.3)	8.4 (7.5–9.5)	21.2 (19.7–22.8)
Current user	43.0 (34.9–51.5)	18.8 (12.8–26.8)	14.2 (9.4–20.8)	24.0 (17.5–31.9)	45.8 (37.5–54.4)	14.9 (9.6–22.3)	18.1 (12.3–25.8)	21.2 (14.9–29.3)	43.0 (34.9–51.5)	18.8 (12.8–26.8)	14.2 (9.4–20.8)	24.0 (17.5–31.9)	45.8 (37.5–54.4)	14.9 (9.6–22.3)	18.1 (12.3–25.8)	21.2 (14.9–29.3)
U.S. census region ^h																
Northeast	58.0 (54.0–61.8)	8.9 (6.8–11.5)	10.6 (8.4–13.3)	22.5 (19.4–26.0)	61.2 (57.3–65.1)	5.7 (4.1–7.8)	9.2 (7.1–11.7)	23.9 (20.6–27.6)	58.0 (54.0–61.8)	8.9 (6.8–11.5)	10.6 (8.4–13.3)	22.5 (19.4–26.0)	61.2 (57.3–65.1)	5.7 (4.1–7.8)	9.2 (7.1–11.7)	23.9 (20.6–27.6)
Midwest	58.1 (54.3–61.7)	7.4 (5.6–9.6)	10.7 (8.5–13.3)	23.9 (20.8–27.3)	64.2 (60.5–67.8)	6.6 (5.0–8.8)	9.6 (7.5–12.2)	19.5 (16.6–22.8)	58.1 (54.3–61.7)	7.4 (5.6–9.6)	10.7 (8.5–13.3)	23.9 (20.8–27.3)	64.2 (60.5–67.8)	6.6 (5.0–8.8)	9.6 (7.5–12.2)	19.5 (16.6–22.8)
South	57.7 (54.8–60.5)	7.8 (6.3–9.5)	9.9 (8.3–11.8)	24.7 (22.2–27.3)	63.1 (60.2–65.9)	6.3 (4.7–7.3)	8.8 (7.2–10.6)	22.3 (19.8–24.9)	57.7 (54.8–60.5)	7.8 (6.3–9.5)	9.9 (8.3–11.8)	24.7 (22.2–27.3)	63.1 (60.2–65.9)	6.3 (4.7–7.3)	8.8 (7.2–10.6)	22.3 (19.8–24.9)
West	61.1 (57.4–64.6)	7.1 (5.5–9.2)	9.5 (7.6–11.8)	22.3 (19.4–25.6)	66.2 (62.6–69.7)	5.8 (4.2–7.9)	8.3 (6.5–10.6)	19.6 (16.8–22.8)	61.1 (57.4–64.6)	7.1 (5.5–9.2)	9.5 (7.6–11.8)	22.3 (19.4–25.6)	66.2 (62.6–69.7)	5.8 (4.2–7.9)	8.3 (6.5–10.6)	19.6 (16.8–22.8)
Annual household income																
< \$15,000	28.0 (21.9–35.1) ^c	12.3 (8.1–18.2)	16.2 (11.4–22.6)	43.5 (36.2–51.1)	35.1 (28.2–42.7) ^c	7.4 (4.4–12.3)	15.7 (10.8–22.2)	45.0 (37.3–53.0)	28.0 (21.9–35.1) ^c	12.3 (8.1–18.2)	16.2 (11.4–22.6)	43.5 (36.2–51.1)	35.1 (28.2–42.7) ^c	7.4 (4.4–12.3)	15.7 (10.8–22.2)	45.0 (37.3–53.0)
\$15,000–\$24,999	43.1 (36.0–50.5)	14.5 (9.9–20.7)	14.7 (10.2–20.7)	27.7 (21.5–34.9)	53.3 (45.6–60.9)	7.4 (4.4–12.3)	15.0 (10.3–21.4)	24.2 (18.2–31.5)	43.1 (36.0–50.5)	14.5 (9.9–20.7)	14.7 (10.2–20.7)	27.7 (21.5–34.9)	53.3 (45.6–60.9)	7.4 (4.4–12.3)	15.0 (10.3–21.4)	24.2 (18.2–31.5)
\$25,000–\$39,999	55.4 (50.9–59.8)	8.5 (6.4–11.3)	10.2 (7.8–13.2)	25.9 (22.1–30.1)	60.3 (55.8–64.7)	8.7 (6.5–11.5)	9.6 (7.3–12.5)	21.4 (17.9–25.4)	55.4 (50.9–59.8							

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