

BACKGROUND & AIMS

- Electronic cigarette (EC) use has increased dramatically in the past decade.
- One concern is that EC use may persist into lifelong non-tobacco nicotine use.
- US adults who never smoked cigarettes but regularly use ECs "every day, some days or rarely" increased a 24-fold from 0.1% in 2010 to 2.4% in 2018 (McMillen et al., 2018).
- Approximately 8% of every day and 16% of some days EC users never smoked cigarettes regularly (Rodu et al., 2017).
- Most (62%) US adult EC users who never smoked cigarettes regularly continued exclusive EC use at a 2-year follow-up (Wei et al., 2020).
- Little is known about the demographics, EC use, or tobacco use characteristics of adults who are regular EC users but never regular combustible tobacco smokers.

Thus we aim to describe US adults who are current EC never regular tobacco smokers in relation to:

- Current EC regular tobacco smokers and
- Never regular EC never regular tobacco smokers.

METHODOLOGY

- Cross-sectional data are from the public use files of the Population Assessment of Tobacco and Health (PATH) Study of US non-institutionalized adults, collected between 2016 and 2018 (N=33,822).
- We identified 14,465 adults who were never regular smokers of combustible tobacco (i.e., cigarettes, cigars, hookah, or pipes).
- Electronic cigarette (EC) use includes any electronic nicotine product.
- In the Figure we illustrate the nested structure of EC use among never tobacco smokers by reporting the proportion of each category using the superseding category as the denominator (e.g., a cascade approach).
- All data are cross-sectional and weighted using SVY procedures.

Table 1. Definitions of tobacco use categories.

Tobacco use categories	PATH Definition
Ever tried	"Respondents who have ever used [the tobacco product]... even one or two times."
Used in past 30 days	"Respondents who have used [the tobacco product] within the past 30 days."
Current experimental use	Respondents who endorsed use in past 30-days and "have never used [the tobacco product] fairly regularly, and currently use every day or some days."
Ever regular use	Non-cigarette tobacco: "Respondents who have ever used [the tobacco product] fairly regularly." Cigarettes: "Respondents who have smoked 100 or more cigarettes in their lifetime."
Current regular use	Respondents who meet criteria for ever established regular use "and currently use every day or some days."
Current established every day use	Respondents who meet criteria for current established regular use "and currently use every day."

RESULTS

Figure. Cascade of EC use among never regular tobacco smokers.

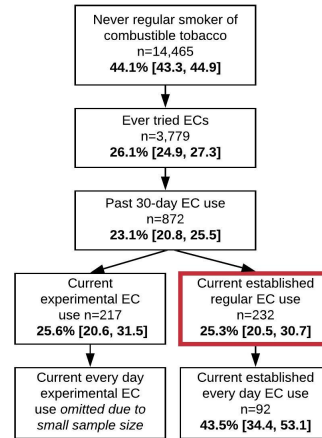


Table 2. Demographic characteristics, % [95% CI].

	Current regular EC, never regular tobacco smokers: raw n=232	Current regular EC, current regular tobacco smoker: raw n=1,196	Never regular EC, never regular tobacco smoker: raw n=13,959
Sex: Female	34.9 [25.4, 45.7] ^b	42.9 [39.2, 46.7]	55.6 [54.2, 57.1]
Age:			
18 to 24 years old	83.5 [75.3, 89.9] ^{ab}	32.2 [28.2, 36.4]	49.5 [48.3, 50.7]
25 to 34 years old	6.3 [2.9, 13.0] ^{ab}	27.8 [24.3, 31.5]	16.7 [15.8, 17.6]
35 to 44 years old	2.9 [0.8, 10.5] ^a	18.8 [15.3, 22.9]	9.7 [9.0, 10.4]
45 to 54 years old	1.1 [0.4, 3.2] ^{ab}	12.2 [9.5, 15.5]	9.7 [6.7, 8.0]
55 to 64 years old	3.8 [1.2, 11.2]	6.3 [4.6, 8.5]	7.3 [6.9, 8.0]
≥65 years old	2.4 [0.5, 10.3]	2.8 [1.6, 4.7]	7.2 [6.4, 8.0]
Marital Status:			
Married	10.6 [6.1, 17.9] ^{ab}	28.8 [25.0, 33.0]	32.9 [31.7, 34.1]
Widowed or separated	5.7 [2.6, 12.1] ^a	20.2 [17.0, 23.9]	9.7 [8.8, 10.6]
Never married	83.7 [75.6, 89.5] ^{ab}	50.2 [45.8, 54.6]	57.0 [55.9, 58.2]
Education:			
<High school	9.6 [5.3, 16.8]	11.5 [9.4, 13.9]	9.8 [9.1, 10.6]
High school grad or GED	40.5 [30.4, 51.5] ^b	35.9 [32.2, 39.7]	27.8 [26.7, 29.0]
Some college or more	49.9 [40.6, 59.2] ^b	52.5 [48.9, 56.1]	62.3 [61.1, 63.6]
Sexual Orientation: LGBTQ+	9.3 [5.3, 15.9]	16.0 [13.0, 19.7]	7.5 [6.8, 8.2]
Race/Ethnicity:			
Black alone	5.9 [2.8, 11.8] ^b	9.0 [7.1, 11.6]	17.3 [16.4, 18.3]
White alone	76.9 [66.2, 85.0]	76.9 [73.3, 80.2]	70.1 [68.8, 71.3]
Hispanic	19.5 [12.8, 28.7]	12.2 [9.6, 15.3]	24.6 [23.4, 25.9]
Other	17.2 [9.8, 28.5]	14.0 [11.0, 17.7]	12.6 [11.8, 13.5]
Employment:			
Full-time	31.8 [22.8, 42.2]	45.1 [41.0, 49.2]	43.2 [41.9, 44.4]
Part-time	35.9 [26.5, 46.7] ^{ab}	19.2 [15.5, 23.4]	25.1 [23.8, 26.4]
Don't work for pay	32.3 [23.2, 42.9]	35.4 [31.0, 40.0]	31.5 [30.4, 32.6]

1.5% (95% CI=1.3 to 1.9) of never regular tobacco smokers were regular EC users.

^aSignificantly different from current regular EC current regular tobacco smokers. ^bSignificantly different from never regular EC never regular tobacco smokers.

RESULTS

Table 3. Electronic cigarette (EC) & tobacco use characteristics.

	Current regular EC, never regular tobacco smokers: raw n=232	Current regular EC, current regular tobacco smoker: raw n=1,196
Daily EC user, %	43.5 [34.4, 53.1]	35.4 [31.1, 39.8]
First puff ≤ 30 minutes after waking	38.8 [28.0, 50.8]	40.7 [36.2, 45.3]
EC most often contains nicotine	74.3 [65.0, 81.9] ^a	91.6 [89.3, 93.5]
EC used most often:		
Rechargeable	95.5 [88.3, 98.4]	94.2 [91.3, 96.1]
Tank system	73.6 [64.5, 81.1]	80.6 [76.5, 84.1]
Cartridges	36.0 [26.5, 46.7]	32.0 [27.8, 36.6]
Refilled with e-liquid	79.8 [69.3, 87.3]	84.4 [80.4, 87.7]
Common EC flavors most often used:		
Fruit	62.4 [52.9, 71.0]	49.3 [45.1, 53.4]
Candy, desserts or other sweets	29.3 [20.5, 39.9]	35.4 [31.2, 40.0]
Menthol or mint	16.8 [9.9, 27.0]	16.9 [13.7, 20.8]
Tobacco	6.5 [2.7, 14.8]	17.4 [14.0, 21.4]
Plans to quit ECs for good:		
In the next 7 days	6.5 [3.3, 12.7]	7.5 [5.7, 9.8]
In the next 30 days	1.6 [0.6, 4.5]	4.9 [3.3, 7.3]
≥6 months from now	42.1 [32.7, 52.2]	45.0 [40.4, 49.7]
Never	48.5 [38.1, 59.1]	39.3 [35.2, 43.6]
Past year EC quit attempts:		
% with ≥ 1 quit	15.3 [10.1, 22.5]	16.7 [13.8, 20.1]
Mean [95% CI] # QAs	2.9 [0.6, 5.1]	2.9 [1.5, 4.4]
Mean [95% CI] # of months of longest QA	3.3 [1.1, 5.5]	3.5 [2.5, 4.5]
Past 30-day tobacco use:		
Cigarettes	30.3 [22.3, 39.8] ^{ab}	100
Cigars	18.2 [12.0, 26.5] ^{ab}	26.3 [31.9, 41.0]
Pipe	0.7 [0.3, 2.0] ^a	6.2 [4.6, 8.4]
Hookah	11.3 [6.8, 18.3] ^b	13.3 [11.0, 16.0]
Smokeless	2.3 [0.3, 15.2]	10.3 [8.0, 13.1]
Snus	4.1 [1.1, 14.2] ^b	6.5 [4.8, 8.9]

^aSignificantly different from current regular EC current regular tobacco smokers. ^bSignificantly greater than never regular EC never regular tobacco smokers (data not shown).

SUMMARY & CONCLUSIONS

Adult US EC never tobacco smokers:

- Are mostly White, young adult, unmarried, men.
- Mostly use refillable, tank, or rechargeable fruit flavored ECs containing nicotine, have no plans to quit in the next 6 months, and did not use tobacco in the past 30 days.

EC never tobacco smokers appear to be a distinct group that differs from dual users and never EC users on multiple demographic, EC use & tobacco use characteristics.

Continued EC use among never regular tobacco smokers could be because few tried to quit ECs in the past year or intend to quit in the near future.

Future longitudinal research is needed to examine quitting among exclusive EC users and the public health implications of long-term EC use in the absence of combustible tobacco.

Declaration of Interests: EMK, PWC, JCW, and ACV have nothing to disclose. JRH has received consulting and speaking fees from several companies that develop or market pharmacological and behavioral treatments for smoking cessation or harm reduction and from several non-profit organizations that promote tobacco control. He also consults for Swedish Match on their harm reduction products.

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