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Portioning out Different Types of E-Cigarettes' Displacement of Combustible Tobacco in US Adults

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meeting of the Japanese Society of Clinical Neuropsychopharmacology and the 35th World Congress Collegium Internationale Neuro-Psychopharmacologicum, Tokyo International Forum, Tokyo, Japan, May 24, 2024; no honorarium, consulting fee or other payment was provided. RN has no affiliation with Pinney Associates, JUUL Labs, or GA. None of these funders had any role in, or oversight of, this work. This work represents independent work by the authors.

Abstract

Background

E-cigarettes are effective tools recommended for stopping smoking. However, displacement via "switching" (among those already smoking) appears to only *partly* explain recent declines in smoking prevalence, suggesting possible displacement in other groups (i.e., never-smokers). The population-health implications of vaping by never-smokers depend on the counterfactual, i.e. whether they would have otherwise remained nicotine-naïve vs. otherwise initiated smoking. Several prior studies quantify the former (i.e., e-cigarette uptake by would-be nicotine-naïve people) but the latter counterfactual is understudied. This study aims to quantify the upper-bound of both switching and diversion, under the assumption that e-cigarettes fully substitute for combustible tobacco, as a first step towards more complex counterfactual-trend modeling.

Methods

Trends in *any* nicotine use (cigarettes, cigars and/or e-cigarettes) in US adults 18 + were modeled using quarterly data from the National Health Interview Survey (NHIS; 2014–2025) overall and by age group. Nicotine-use trends were characterized by product-use status (exclusive combustible use, exclusive vaping, and dual use); exclusive vaping was further stratified by lifetime use of combustible products (cigarettes and/or cigars).

Results

Use of *any* nicotine product showed a modest linear decline (18.4%–16.2%; -0.17 percentage points annually) among adults overall; exclusive vaping increased to 29.5% of nicotine users in 2025. Under the counterfactual assumption that this displaced combustible product use, this total displacement portions into upper bounds of 73.9% from switching (i.e., 9.1 million adults who previously combustible products and switched to vaping) and 26.1% from diversion (i.e., 3.2 million never-combustible-users who initiated vaping instead of combustible products). Younger age groups had both higher total displacement (increasing to 58.1% of 18-29-year-olds) and a larger role of diversion (45.8% of total displacement).

Discussion

Under the understudied counterfactual assumption that e-cigarettes and cigarettes substitute for each other among nicotine-seeking adults, e-cigarettes may have helped up to 9.1 million adults switch and diverted up to 3.2 million adults from ever smoking. E-cigarettes' population benefits may extend beyond switching alone, particularly among younger adults.

Introduction

E-cigarettes are among the most effective smoking cessation aids[1] and are also the most widely-used stop-smoking aid by adults in the US[2] and UK.[3] Given e-cigarettes' superiority in terms of both efficacy and reach, the resulting population *impact* is large according to real-world evidence.[4] For example, in the UK, Jackson et al. quantified an impact score of different quit methods, finding that e-cigarettes' impact was overwhelmingly higher than any other method (~ 38 vs ~ 2 or less)[3] and in the US, smoking prevalence declined faster than expected from prior trends and with a magnitude proportional to the degree of e-cigarette uptake.[5]

Prior work from our group showed that nicotine use (estimated as the use of cigarettes and/or e-cigarettes) among US adults declined only modestly (from ~ 18% to ~ 16% over 2014–2024), yet underneath this approximate stability there were large shifts in product preference: away from exclusive cigarette smoking and towards exclusive vaping.[6] These trends almost certainly represent evidence detectable at the population level of e-cigarettes' impact in helping adults stop smoking. However, it is notable that the age groups with the most pronounced shift away from combustible cigarette smoking (i.e., 18–29 year-olds, followed by 30–44 year-olds) are less likely to have ever smoked to begin with. Smoking prevalence among young adults has repeatedly reached new historic lows over the past decade[7] and has declined faster than pre-e-cigarette trends predicted.[5,8] This leaves a comparatively small pool of smokers within whom switching could occur; indeed, the portion of e-cigarette use accounted for by switching away from smoking appears *less* than the total population-level displacement of cigarettes by e-cigarettes.

This raises the possibility that there are other ways by which e-cigarettes displace smoking. One understudied possibility is that e-cigarettes may "divert" youth and young adults who are predisposed to use nicotine *away* from cigarette smoking.[9–12] Uptake of e-cigarettes by never-smokers is often interpreted as a net *harm*,[13–16] with the implicit assumption that these individuals would have otherwise remained nicotine-naïve if not for e-cigarettes. However, others have pointed out that the public health implications depend on the counterfactual, or what these people would have done otherwise had they not used e-cigarettes.[9–12,17,18] There is a shortage of research of e-cigarettes' population impact under the latter assumption that e-cigarettes substitute for cigarettes (even in never-smokers); in particular, for people with "common liability" factors that predispose them simultaneously to smoking and vaping,[19–21] vaping instead of smoking would avoid a lifetime of exposure to combustion.

Though population trends cannot demonstrate causality, findings that smoking declined faster after the uptake of e-cigarettes[9,18,22] are consistent with a diversion explanation. More importantly, a robust body of econometric and quasi-experimental evidence supports that e-cigarettes and cigarettes are economic substitutes for each other,[23–26] meaning that people will use one product in lieu of the other depending on factors including product availability, cultural norms, regulatory and/or monetary barriers, appeal, etc. Notably, economic substitution has been documented not only for current use,[23–26] but also for outcome

of *smoking initiation*,[27] which logically documents a diversion effect whereby even some never-smokers may choose between initiating with e-cigarettes and initiating with cigarettes.

The question of e-cigarettes' impact on population trends is fundamentally important for public health and regulation of nicotine/tobacco products (NTPs). However, potential diversion effects are difficult to quantify at the population level due to the difficulty of estimating the counterfactual (i.e. what never-smokers who vape would have done otherwise), which cannot be observed directly but requires complex indirect estimations. A previous article quantified the diversion effect using simulation modeling among youth[9] but this did not yield easily-interpretable estimates. A previous article in adults documented possible displacement in current smoking trends but could not determine switching from diversion components.[5] Moreover, our previous work only examined displacement of *cigarettes*, but cigars remain another commonly-used combustible product whose use may be increasing in some groups[28] and which cause harm that would be reduced if displaced by e-cigarettes.

As a first step towards counterfactual trend modeling, the current study aims to estimate upper bounds of e-cigarettes' potential displacement of combustible product use (cigarettes and/or cigars), both overall and portioned into (a) switching (i.e., lifetime users of combustible products who switched to vaping) and (b) diversion (i.e., never-combustible-users who took up vaping instead of cigarettes or cigars). We quantify this descriptively using adult (18 + years) prevalence trends from the National Health Interview Survey NHIS) over 2015–2025. We make the counterfactual assumption that users of *any* NTP would otherwise use a different NTP (rather than be nicotine-abstinent), based on quasi-experimental evidence of economic substitution among both smokers and non-smokers. While this assumption cannot be proven, our goal is to provide an upper-bound estimate of e-cigarettes' impact on switching and diversion. The intent is to lay groundwork for future counterfactual trend modeling work and provide displacement estimates that – along with other published estimates under the opposite assumption – can be incorporated into sensitivity analyses in future research and regulatory efforts to evaluate e-cigarettes' impact on population health.

Methods

Sample

Quarterly data from NHIS over Q1 2015 through Q4 2025 were analyzed. NHIS is an annually repeated cross-sectional survey on the health of the US population, funded by the National Center for Health Statistics. It is designed to be representative of the US civilian, non-institutionalized adults aged 18+. A total of 325,923 adults were surveyed over the study period, ranging between 24,215 and 33,672 participants each year. All analyses accounted for the complex survey design using the sampling weights, strata and primary sampling units provided within the data. Data are publicly available and can be accessed through the National Center for Health Statistics webpage (https://www.cdc.gov/nchs/nhis/). This research was exempt from ethical oversight of human subjects

research as this involves only secondary data analysis of deidentified data (Exemption 4 under the Common Rule).

Measures

Current use of cigarettes was defined by 1) lifetime history of smoking 100 or more cigarettes and 2) the response of smoking “every day” or “some days.” Current use of e-cigarettes and cigars were identified by the “every day” or “some days” use of “e-cigarettes or other electronic vaping products” or “regular cigars, cigarillos, or little filtered cigars,” respectively. Lifetime thresholds were not applied for e-cigarettes and cigars, as they were not evaluated in NHIS; the resulting inclusion of *experimental* use of cigars has a conservative effect on estimated displacement (see Supplement).

Any nicotine use was approximated as current use of cigarettes, cigars, and/or e-cigarettes. Analyses were limited to cigarettes, cigars, and e-cigarettes, the three most prevalent tobacco products during the study period and the only products that have been assessed consistently in the NHIS throughout the study period.[29] While most research on e-cigarette substation focuses on cigarettes, cigars are included here for several reasons; this has a conservative effect (see Supplement). First, cigarettes and cigars are highest on the continuum of risk and displacement by e-cigarettes would reduce risk; in contrast, for smokeless tobacco, the question of risk reduction is less clear (and in the case of nicotine pouches, displacement by e-cigarette would likely *increase* risk); therefore, this analysis not consider smokeless tobacco products. Further, other NTPs (including pipes, hookah, and smokeless tobacco) had low prevalence,[29] were inconsistently assessed over time, and would have exponentially increased the number of product-use combinations, complicating the study’s objective of illustrating the upper bound of diversion.

Within those reporting *any* nicotine use, four product use categories were identified as follows: exclusive combustible product use, dual use of combustible(s) and e-cigarettes, and exclusive vaping with or without lifetime use of combustible products (i.e., 100 or more cigarettes in lifetime without current smoking and/or lifetime use of cigars without current cigar use).

For age-stratified analyses, subgroups were identified based on ages 18–29, 30–44, 45–59, and 60+.

Analyses

First, trends in *any* nicotine use were modeled over the time period to smooth out quarterly fluctuations among all adults and by age groups. Several parametric assumptions were tested (e.g., linear, quadratic, or cubic) and the best fitting curve was chosen based on Rao-Scott likelihood ratio tests.

Next, the distribution of product-use categories (exclusive combustible product use, exclusive vaping with or without lifetime use of combustible products, and dual use) within overall nicotine use was examined, again overall and by age group. To estimate the upper bounds of diversion, we assumed that

e-cigarettes and combustible products substitute for each other, i.e. adults who use *any* NTP would otherwise have used a different NTP had they not used the first one, rather than being nicotine-abstinent. Under this the deliberately extreme assumption, e-cigarettes' *total* displacement is the proportion of nicotine use that is exclusive vaping (with or without lifetime use of combustible products). This total displacement is portioned into (a) exclusive vaping by former-combustible users (i.e., an upper bound of e-cigarettes' displacement via switching) and (b) exclusive vaping by never-combustible users (i.e., an upper bound of e-cigarettes' displacement via diversion).

A supplementary analysis was performed examining only cigarette and/or e-cigarette use (i.e., ignoring cigars). This was done to provide estimates of displacement that are consistent with the majority of existing research on this topic (which ignores cigars and other NTPs), and as a sensitivity analysis, especially given the asymmetry in how cigarettes vs. cigars are assessed (i.e., experimental smokers are not included but experimental cigar users are).

Results

Any nicotine use declined modestly from 18.4% of US adults in 2015 to 16.2% in 2025. This was best fit by a linear trend with an average annual decline of 0.17 percentage points (Fig. 1).

While age-stratified trends in overall nicotine use differed slightly in shape (Fig. 2), prevalence remained flat over time among younger adult groups (ages 18–29: 19.9% to 17.9%; ages 30–44: 21.2% to 19.6%; no significant temporal trends) and modestly declined in older adult groups (ages 45–59: 21.6% to 17.6%; ages 60 + 11.7% to 11.2%).

Within overall nicotine use, there was a marked shift away from exclusive combustible use and towards exclusive vaping, with dual use prevalence being low and approximately stable (Fig. 3). Exclusive vaping increased to 29.5% of nicotine users by 2025, representing an upper bound for e-cigarettes' total displacement of combustible products among adult nicotine users under our operating assumption that these exclusive vapers would have otherwise used combustible products. This total displacement is portioned into 21.8% of nicotine users who had *previously* smoked cigarettes and/or cigars (representing an upper bound for displacement via switching) and 7.7% of nicotine users who had *never* used cigarettes or cigars (representing an upper bound for displacement via diversion; Fig. 3 and Table 1). As a percentage of total displacement, switching accounted for 73.9% and diversion for 26.1%.

When examining these trends by age group (Fig. 4), again under the operating assumption that exclusive e-cigarette users would have otherwise smoked cigarettes or cigars, e-cigarettes' total displacement of combustible products declines sharply in progressively older age groups (45.8% of 18–29 year-old nicotine users, 13.6% of 30–44 year-old nicotine users; 6.4% of 45–59 year-old nicotine users; and 3.2% of 60 + year-old nicotine users). Moreover, the *type* of displacement varies substantially across age group: among adults aged 30+, the majority of displacement is among those with previous history of using combustible products, representing (the upper bound estimate of) switching, while displacement among never-combustible-users (representing an upper bound estimate of diversion) is small.

Conversely, in adults aged 18–29, almost half (45.8%) of displacement occurred among never-combustible users, representing an upper bound of diversion.

Calculating the proportion of total displacement and the estimated (upper-bound) portions that are due to switching vs. diversion (Table 1) shows that the two largest estimated displacement categories appear to be due to diversion in adults aged 18–29 years (26.6% of nicotine users in this age group) and switching in adults aged 30–44 years (28.9% of nicotine users in this age group). More broadly, estimated diversion was extremely low in adults aged 60 + and increased sharply in younger age groups, while estimated switching did not have a clear patterning by age group.

Sensitivity analyses that included only cigarettes and/or e-cigarettes (i.e. ignoring cigar use) are presented in the Supplement. When ignoring cigars (consistent with most other research on this topic), total displacement is larger (due to substantial rates of cigar use in never-established smokers), as is the portion due to diversion. In fact, when only considering e-cigarettes and cigarettes, diversion is the *predominant* type of displacement in the youngest age group.

Table 1
Upper-bound estimates of total displacement and estimated portions from diversion and switching, among US adults overall and by age group.

Age Group	Total Displacement[1]		Upper Bound of Diversion[2]		Upper Bound of Switching[3]		Ratio of Diversion within Total Displacementin 2025[4]
	% of nicotine users	N	% of nicotine users	N	% of nicotine users	N	
All Adults	29.5%	12,251,257	7.7%	3,198,205	21.8%	9,053,052	26.1%
18–29	58.1%	5,394,444	26.6%	2,469,668	31.5%	2,924,775	45.8%
30–44	33.5%	4,350,074	4.6%	591,880	28.9%	3,758,194	13.6%
45–59	17.3%	1,761,440	1.1%	113,067	16.2%	1,648,373	6.4%
60+	8.1%	745,299	0.3%	23,590	7.9%	721,709	3.2%

[1] Proportion (population N) of exclusive vapers (with or without lifetime smoking history) among overall nicotine users in 2025

[2] Proportion (population N) of exclusive vapers without lifetime smoking history among overall nicotine users in 2025

[3] Proportion (population N) of exclusive vapers with lifetime smoking history among overall nicotine users in 2025

[4] N of exclusive vapers without lifetime smoking history, divided by N of total displacement (i.e., column 2 divided by column 1)

Discussion

This analysis of NHIS prevalence trends confirms prior work showing that the US adult population has partially shifted away from cigarettes to e-cigarettes over the past decade. The inclusion of cigars further supported the finding that *any* nicotine use is stable over time among US adults, as the prevalence of *any* nicotine use showed only a modest annual decline of 0.17 percentage points overall, and was essentially flat among younger age groups. We extend prior work by portioning out e-cigarettes' estimated total displacement (upper bound of 29.5% of nicotine users) into switching (upper bound of 21.8% of nicotine users, representing 73.9% of total displacement) vs. diversion (upper bound of 7.7% of nicotine users; representing 26.1% of total displacement), under the counterfactual assumption that NTPs substitute for each other and that exclusive vapers would have otherwise smoked cigarettes or cigars. However, there were striking differences by age group, such that younger adults (18–29 years) had the largest total displacement (58.1% of nicotine users), with roughly equal rates of diversion (45.8%

of total displacement) and switching (54.2% of total displacement). In contrast, older adults had lower total displacement (e.g., 8.1% of 60 + year-old nicotine users), of which the majority (~ 97% of total displacement) was switching.

The annual decline of 1.2% in *any* nicotine use may modestly oppose our assumption that e-cigarettes fully substitute for combustible products in all cases. However, given the much larger shifts in the share of nicotine being consumed via specific products, the question of e-cigarettes displacing combustibles is valid and important for the nicotine use that is still occurring. Moreover, the shape and slope of the overall nicotine use trend is sensitive to fluctuations in data points (not shown) and not all tobacco products are accounted for (here, only cigarettes, cigars, and e-cigarettes, as discussed in Limitations). If this is a true decline, it is important to note that real-world complex systems decline exponentially – not linearly – and that this decline will flatten out as nicotine use prevalence approaches its natural "floor",[30,31] meaning nicotine use is unlikely to ever reach zero prevalence, and the question of product substitution will continue to be important.

Some results appear surprising: for example, given that initiation overwhelmingly occurs during adolescence,[32] any degree of diversion in adults aged 60 + may seem high. Note, however, that *total* displacement is much lower in this age group (3.2% of nicotine users vs. 26.1% for adults overall). Diversion is not outside the realm of possibility in older adults: one-quarter of smokers are "late initiators" (ages 20+, with no further breakdown of the long tail)[32] and in some groups (e.g., disadvantaged women), smoking prevalence *rises* throughout early middle age (early 40's),[33] which logically requires net initiation and/or reuptake. NHIS data (not shown) confirm that smoking initiation among adults aged 60 + numbers in the tens of thousands; therefore, the small amount of diversion in this age group is plausible.

As others have pointed out, the public health implications of e-cigarettes depend entirely on the counterfactual of whether vapers would have otherwise smoked vs. would have otherwise been abstinent from all nicotine.[17] While the current trends are primarily descriptive, our interpretation makes the counterfactual assumption that *all* NTP users would have otherwise used another NTP; specifically, that exclusive vapers would have otherwise smoked cigarettes or cigars if they had not used e-cigarettes. Under the opposite assumption – that exclusive vapers would have otherwise been abstinent from nicotine – our estimates of switching would instead represent *continued* nicotine use among people who would have otherwise quit combustible tobacco and all other NTPs; and our estimates of diversion would instead represent *uptake* of e-cigarettes among people who otherwise would have never used nicotine (upper bound of possible harmful impacts). It is important to note that neither extreme is likely to hold; the true effects almost certainly lie between these bounds, and future research should more precisely quantify the relative contributions of each, which may guide the evaluation of net population impact of e-cigarettes.

Though the true counterfactual cannot be known for certain, there is strong evidence that e-cigarettes displace cigarettes through switching, including from randomized controlled trials and real-world

observational data.[34–36] The question of diversion is more difficult to examine because it rests on a counterfactual that can only be inferred indirectly rather than directly observed, whereas switching is readily observable among people with a history of smoking. However, its existence is supported by robust quasi-experimental evidence showing that e-cigarettes and cigarettes are substitutes,[23–26] even in never-smokers,[27] and population trends showing that smoking declined faster after the introduction of noncombustible alternative such as snus in northern Europe,[37] heated tobacco products in Japan[38] and e-cigarettes in the US.[5,8,9]

Given the ambiguity of vaping in never-smokers, it is important for population research and policymakers to consider the full range of possible scenarios, but the literature to date has predominantly interpreted vaping in never-smokers as a *harm* (i.e., making the counterfactual assumption that these never-smokers would otherwise have remained nicotine-naïve). Our purpose in focusing on the opposite assumption – that e-cigarettes fully substitute for combustible products – is therefore intended to provide a plausible bound in the opposite direction (i.e., upper bound of a potential benefit from displacement of combustible product use via diversion and switching).

One implication of our work is for future research on population modeling. Population models examining the impact of e-cigarettes often intentionally make pessimistic assumptions.[39,40] For example, a gateway effect is often modeled, despite lack of evidence (or even contradictory evidence) from population trends[5,6,9,41]; however, very few population models (see Levy et al.[42] and Muhammad-Kah et al.[43]) allow for the possibility of a diversion effect. While there is value in models that make overly conservative assumptions, models are also needed that test sensitivity analyses across the full range of plausible assumptions. Our work is among the first to quantify an upper bound for a diversion effect, which can be incorporated into a range of assumptions in future population modeling and projections.

Limitations

The key limitation of this study is that causality cannot be determined from these observational prevalence trends. We intentionally make the counterfactual assumption that cigarettes and e-cigarettes are substitutes for each other, with the intention on estimating an “upper bound” for e-cigarettes’ potential displacement of cigarettes via switching and diversion. Under the opposite assumption, these trends could be interpreted as an “upper bound” of potential harm via continued nicotine use among would-be nicotine quitters and uptake by would-be nicotine-naïve individuals, respectively. However, as the latter assumption is common in studies of vaping by never-smokers,[13–16] our goal is to provide an estimate at the other end of the plausible range of e-cigarettes’ population impacts, as a first step towards conducting more rigorous counterfactual-trend modeling to precisely estimate the extent to which e-cigarettes could be augmenting vs. displacing cigarettes.

Additionally, the current data cannot distinguish between switching (among people who smoked recently) and *maintenance* of switching (among people who have been quit for longer periods of time),

as NHIS lacks information about quit duration. Relatedly, NHIS data cannot identify people who first switched from smoking to vaping and then discontinued vaping; this omission may underestimate e-cigarettes' total displacement of combustible tobacco.

A simplification was that only cigarette, cigar, and e-cigarette use – the three most commonly used NTPs – contributed to the broader category of *any* nicotine use, due to low prevalence and inconsistent assessment over time of other NTPs. This simplification may impact results in modest ways, such as by further flattening or even slightly increasing total nicotine use trends (when other NTPs are accounted for) and by reducing estimates of displacement (if occurring among those who used other NTPs but never used cigars or cigarettes). Nevertheless, the inclusion of cigars is a more conservative approach (see Supplement showing larger displacement when cigars are ignored) than prior similar studies on this topic, and together with the inability to capture people who switched to vaping and then stopped vaping, the current results may underestimate displacement. In any case, future research may benefit from incorporating other NTPs, such as oral nicotine pouches which are increasing in US adults.[44]

Additionally, NHIS assessed cigarettes vs. cigars asymmetrically, with vs. without a cumulative lifetime threshold (i.e., 100 + cigarettes/life vs. ever smoked a cigar even once). This required us to classify cigar *experimenters* as established users, which modestly shift the balance of displacement: former cigar experimenters who vape are currently classified as switched, but (if cigar use were assessed equivalently to cigarette use) would be classified as diverted.

Conclusions

This analysis of quarterly NHIS data examines e-cigarettes' possible displacement of combustible products both among adults who smoked (via switching away from smoking) and among never-combustible-users (via diversion). The impact of vaping in never-combustible-users is ambiguous and depends on the counterfactual (i.e. whether they would have remained nicotine-naïve or would have smoked cigarettes and/or cigars); as prior research typically assumes harm, the current study aimed to provide upper-bound estimates of benefit (displacement via switching and diversion) to lay groundwork for future more refined counterfactual trend modeling. This work can ultimately enable future population research and policymakers to examine a full range of plausible scenarios.

Under this assumption, e-cigarettes may have displaced up to 29.5% of nicotine users (~ 12.3 million adults) away from smoking; this total displacement was portioned into 73.9% from switching (or up to 21.8% of nicotine users [~ 9.1 million] who switched away from smoking) and 26.1% from diversion (or up to 7.7% of nicotine users [~ 3.2 million] who were diverted from smoking). These results suggest that e-cigarettes' population benefit via displacing combustible tobacco could extend well beyond helping adults who already smoke switch away from smoking. This was especially true for younger adults, who had both a larger total displacement and a greater contribution by diversion compared to older adults (45.8% of total displacements, vs. 3.2% among adults 60+). These upper-bound estimates of benefit,

along with other published upper-bound estimates of harm, should be incorporated into future population health research and policymaking to explore a full range of plausible scenarios.

Declarations

Disclosures: A.S. and S.K. are full-time employees of Pinney Associates, Inc. (PA). Since October 2019, PA has been and continues to consult to Juul Labs on nicotine vapor products to advance tobacco harm reduction. A.S. also individually consults to the Global Forum on Nicotine (GFN) and to the Association of Swedish Snus Manufacturers. Additionally, in October-December 2024, PA also consulted to Philip Morris International (PMI) on US regulatory pathways for non-combustible, non-tobacco, nicotine products. PA does not consult on combustible tobacco products. Also in the past 3 years, A.S. provided consulting services on behavioral science to the Center of Excellence for the Acceleration of Harm Reduction (CoEHAR) which received funding from the Global Action to End Smoking (GA). None of these funders had any role in, or oversight of, this work.

During the past 3 years R.N. has received grant and contractual funding from the National Institutes of Health and the Food and Drug Administration. The Progressive Policy Institute sponsored a trip (travel and lodging) for R.N. to present a paper at a symposium: Can e-cigarettes help tobacco cigarette smokers quit? A review of the evidence, Tobacco Harm Reduction – an Update, 54th annual meeting of the Japanese Society of Neuropsychopharmacology, jointly held with the 34th annual meeting of the Japanese Society of Clinical Neuropsychopharmacology and the 35th World Congress Collegium Internationale Neuro-Psychopharmacologicum, Tokyo International Forum, Tokyo, Japan, May 24, 2024; no honorarium, consulting fee or other payment was provided. RN has no affiliation with Pinney Associates, JUUL Labs, or GA.

None of these funders had any role in, or oversight of, this work. This work represents independent work by the authors.

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Figures

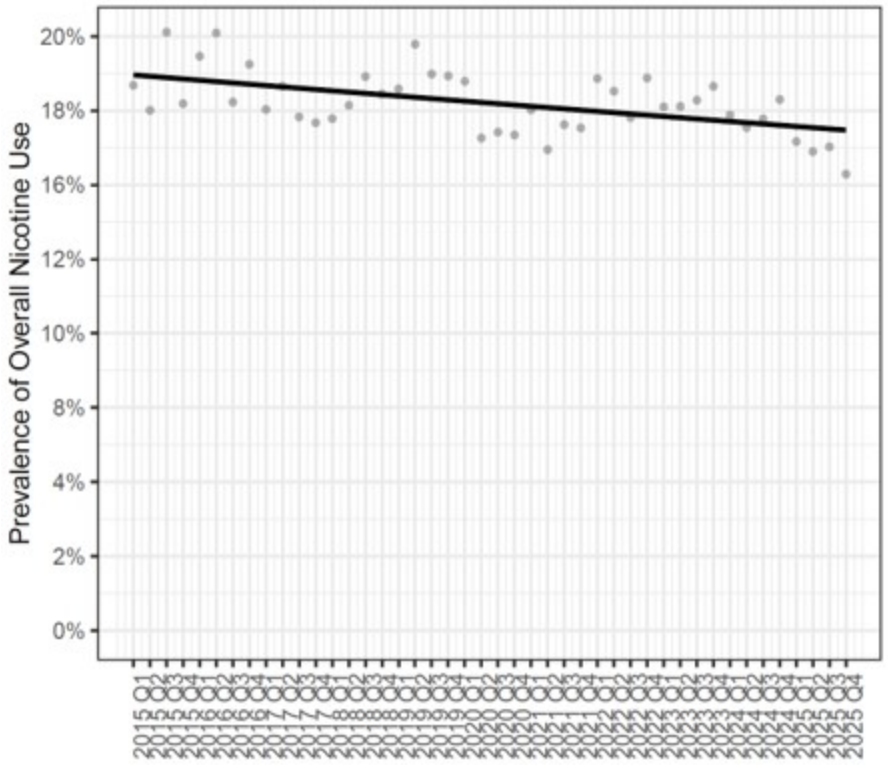

Figure 1

Point estimates and best-fit trend line of any nicotine use prevalence among US adults.

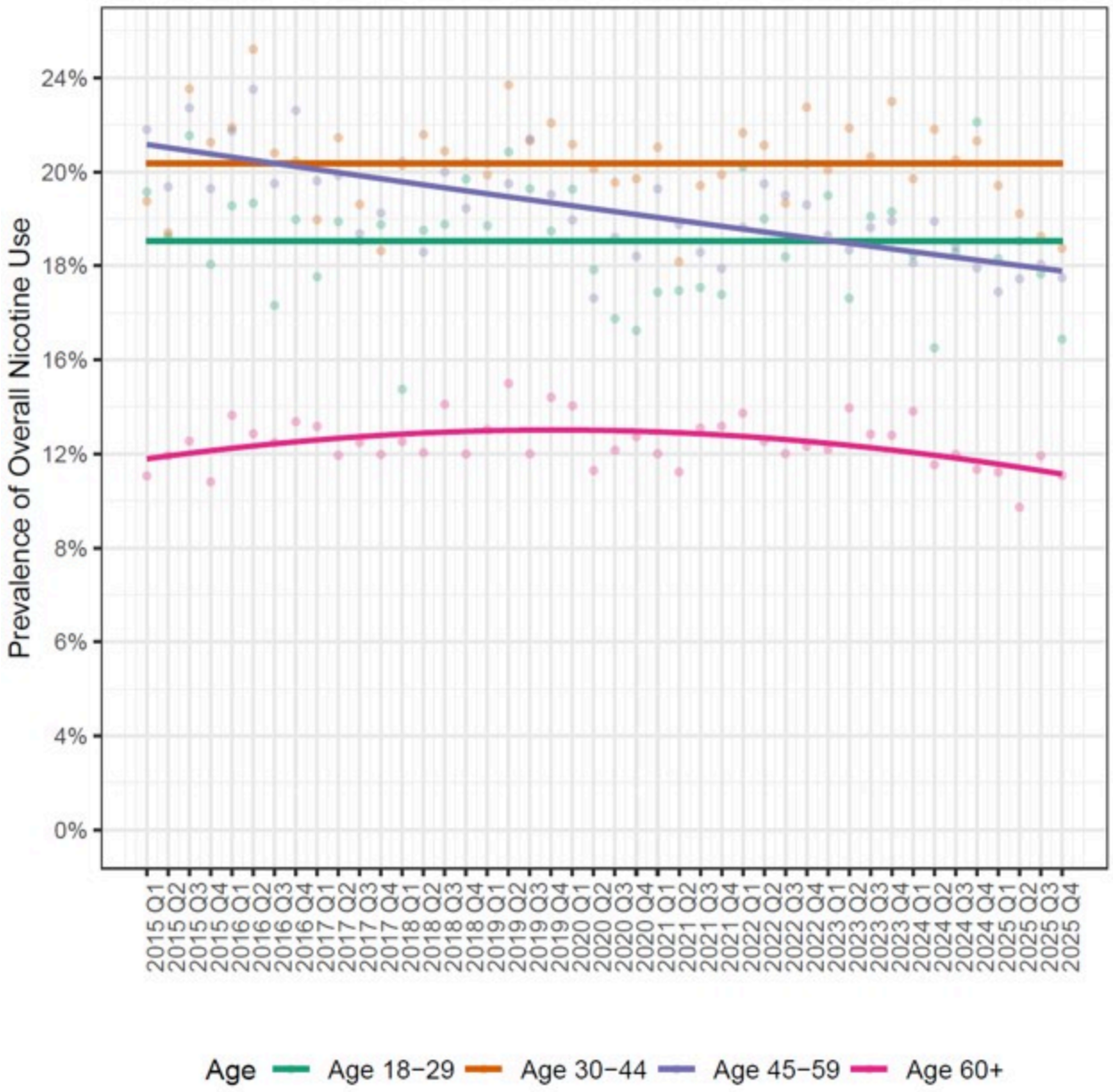

Figure 2

Point estimates and best-fit curves of any nicotine use prevalence by age group.

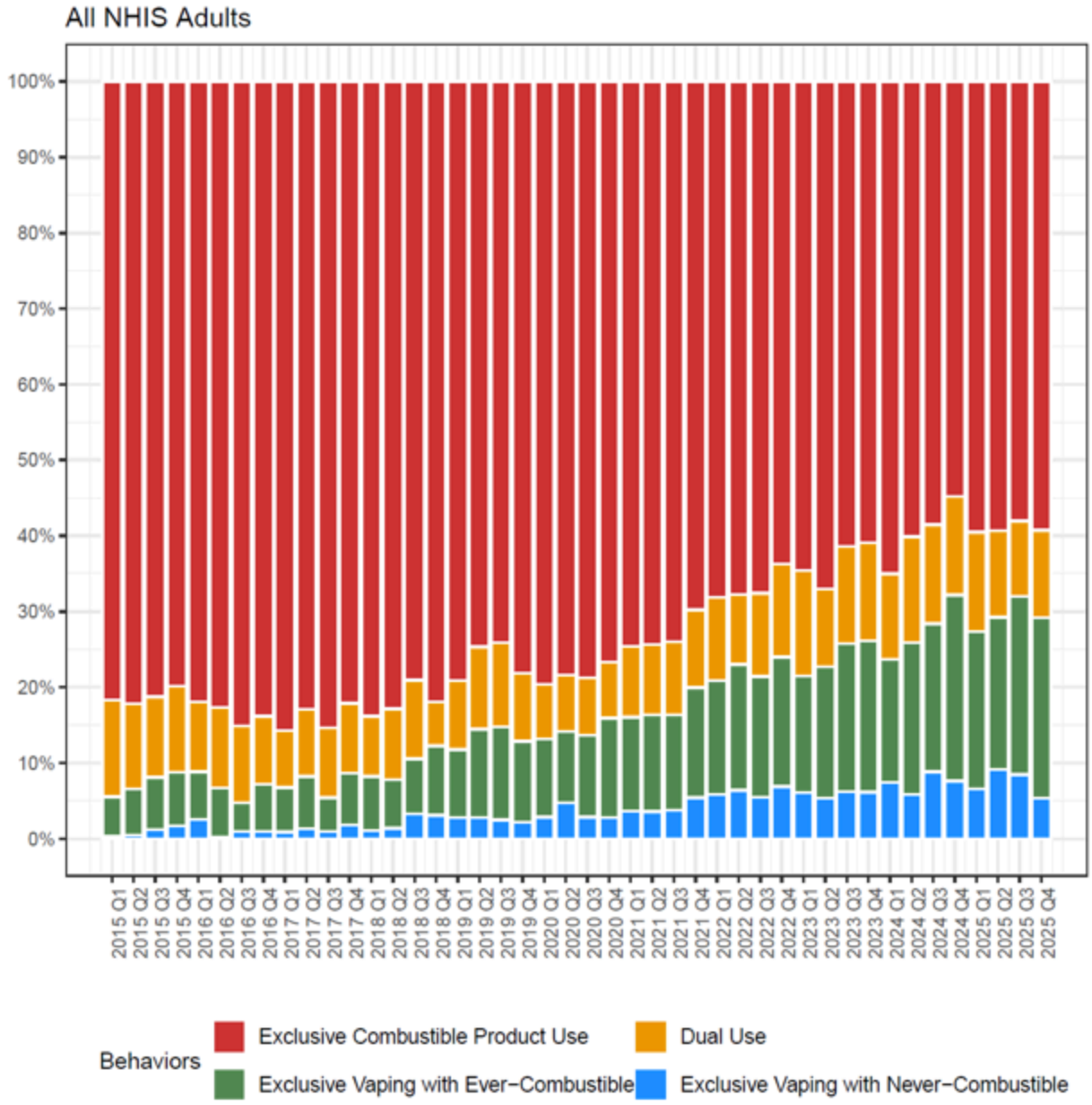

Figure 3

Product-use categories by ever-combustible use status among US adult nicotine users overall.

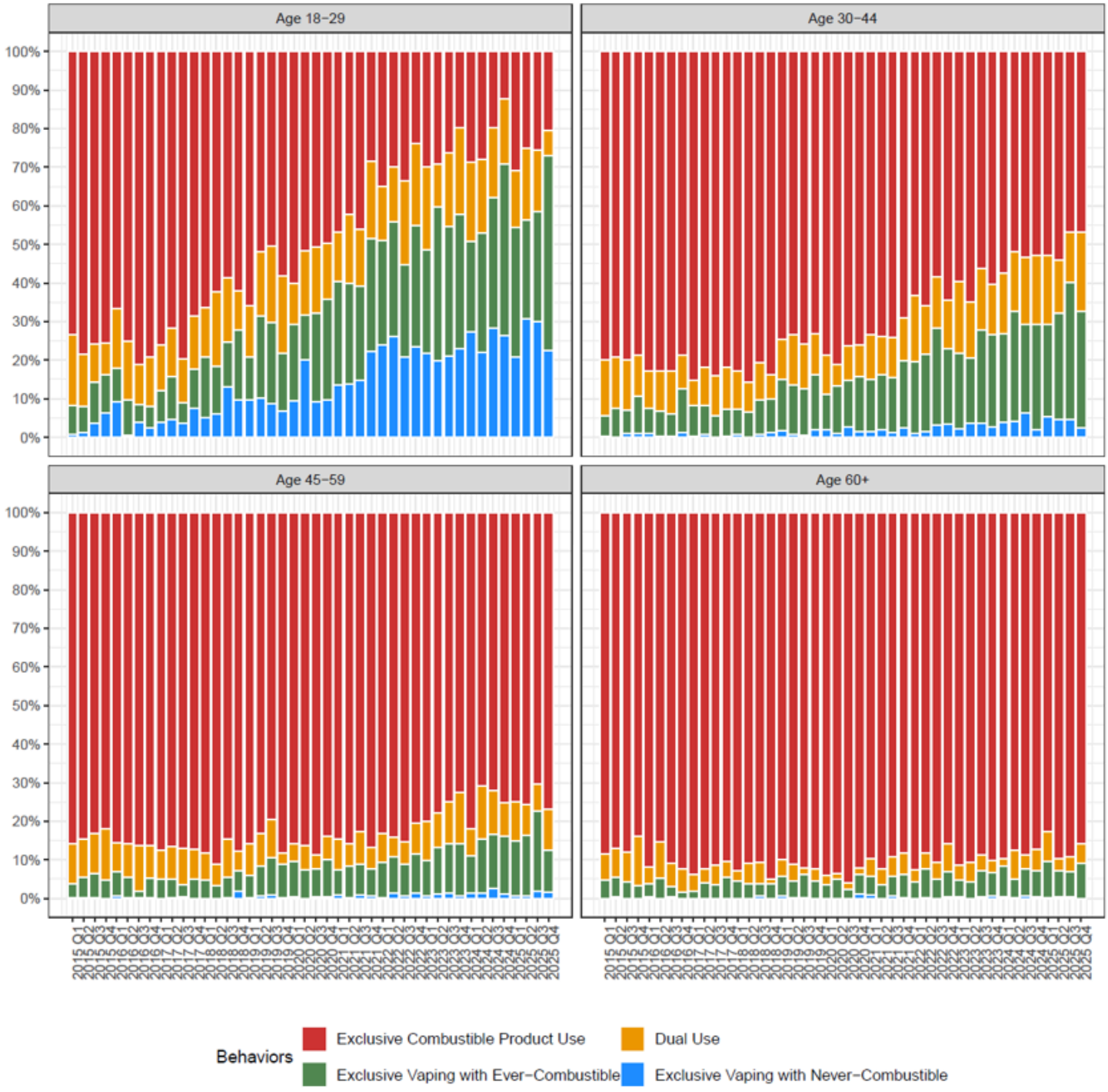

Figure 4

Product-use categories by ever-combustible product use status among US adults by age group.

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