



# Dual Users Decoded: Exploring the Mosaic of Behaviors and Unique Journeys

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# Disclosure

- All authors are employed by Altria Client Services LLC.



# Outline

## Background

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## Characterizing heterogeneity within the dual user population

- Segmenting the dual use population by
  - Frequency of product use
  - Smoking intensity (CPD)

## Relevance of changes in smoking intensity among dual users

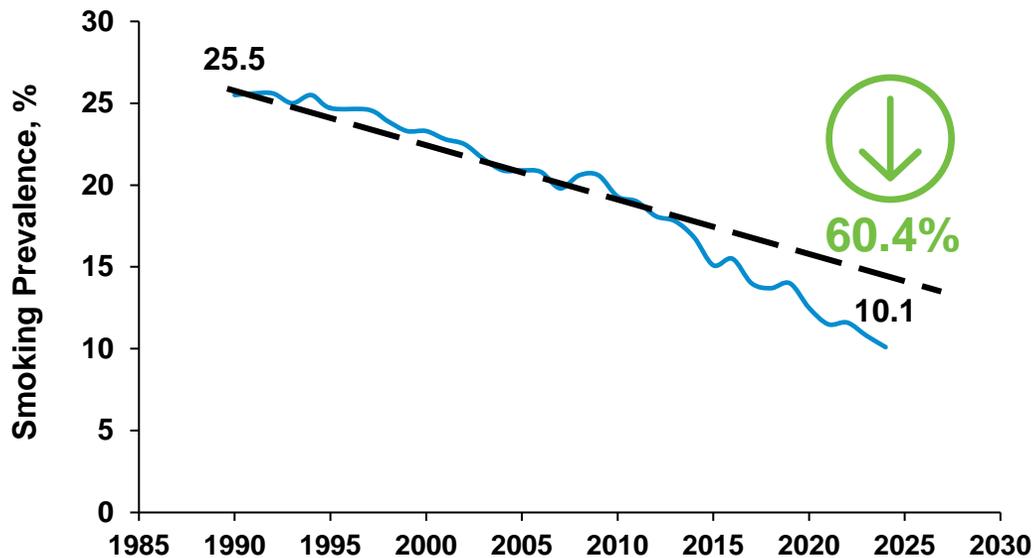
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## Key Takeaways and Implications



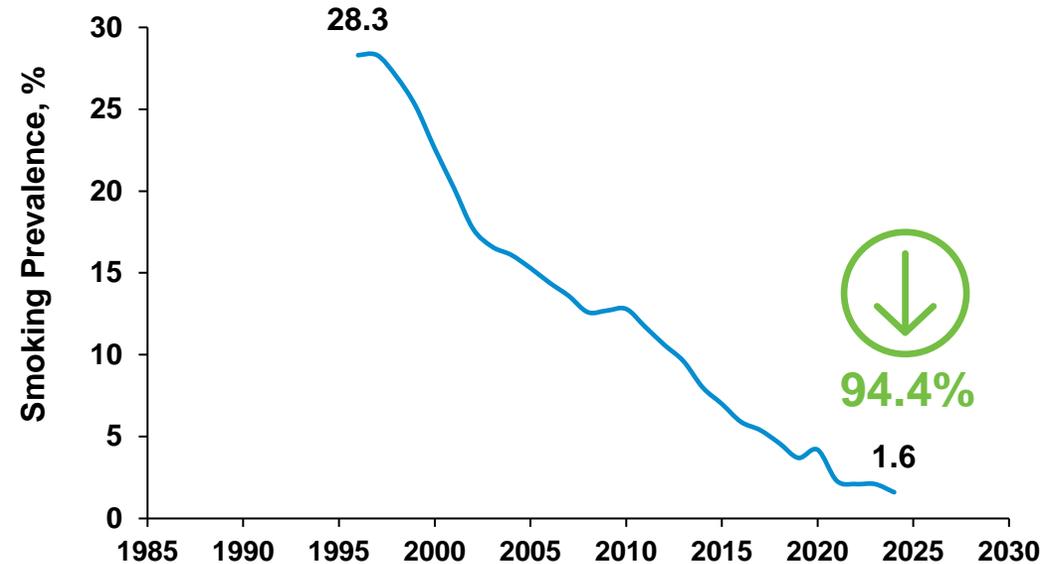
# Adult and Youth Smoking Prevalence Continues to Decline

### Decline in Adult Smoking Prevalence (1990-2024)



Smoking prevalence as reported in the National Health Interview Survey (NHIS) between 1990-2024 for adults 18+ NHIS definition for adult current smoking is at least 100 cigarettes and currently smoke every day or somedays

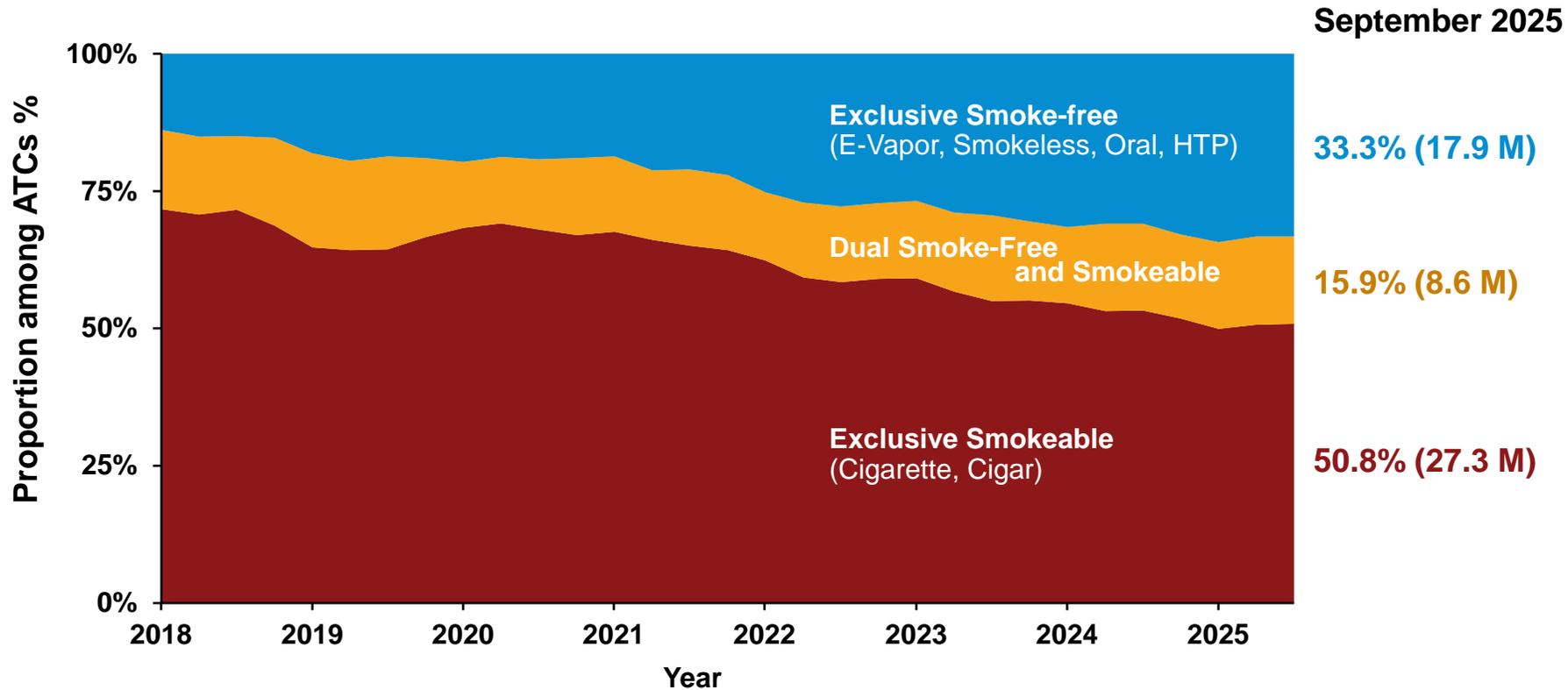
### Decline in Youth Smoking Prevalence (1996-2024)



Smoking prevalence as reported in the Monitoring the Future (MTF) between peak in 1996 to 2024 among 8, 10 and 12 graders. MTF definition past 30-day smoking

# Exclusive Use of Smoke-free Products More Than Doubled (2018-2025) Dual Use has Remained Constant

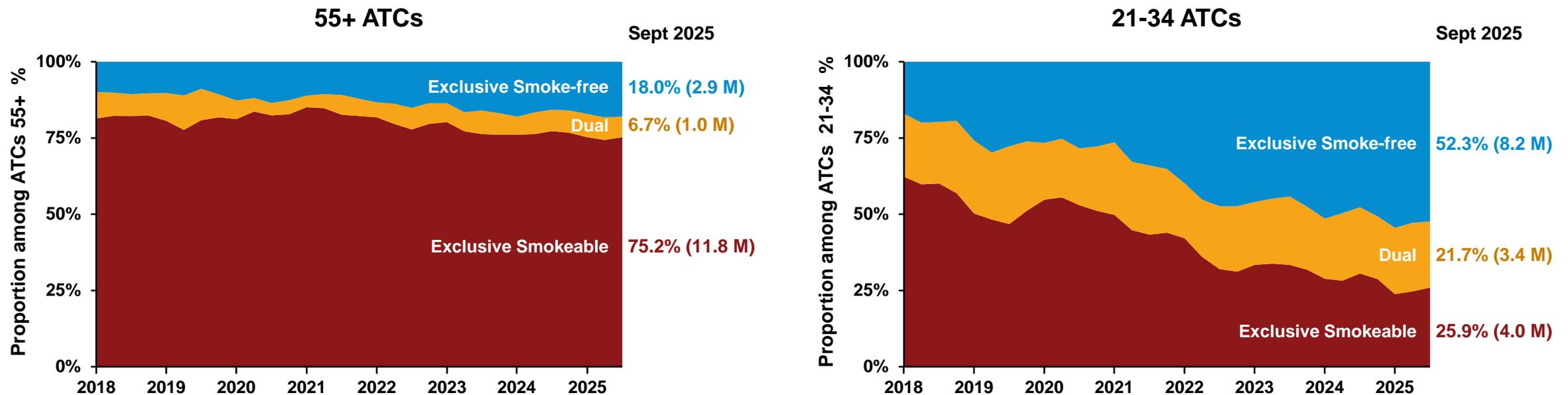
**Proportion of ATCs (21+) Using Exclusive Smoke-free, Exclusive Smokeable, or Dual of Both**  
 Source: ATCT (6 Moving-Month Distribution)



Source: Age 21+, ATCT (6mm distribution) RA Jul 2017 to Sep 2025. Numbers may not foot due to rounding. %'s computed on population weights. HNB has data only from Jan 2020  
 OTPs include hookah, chew, pipe tobacco, etc. Exclusive use of OTPs is not included in base for analysis. Use of OTPs is considered in the count of product usage (as 'Other') in all analysis. Internal docket: 2025-AH-64

# Among Older (55+) ATCs, the Proportion of Exclusive Smokeable Users Remains High and Relatively Unchanged

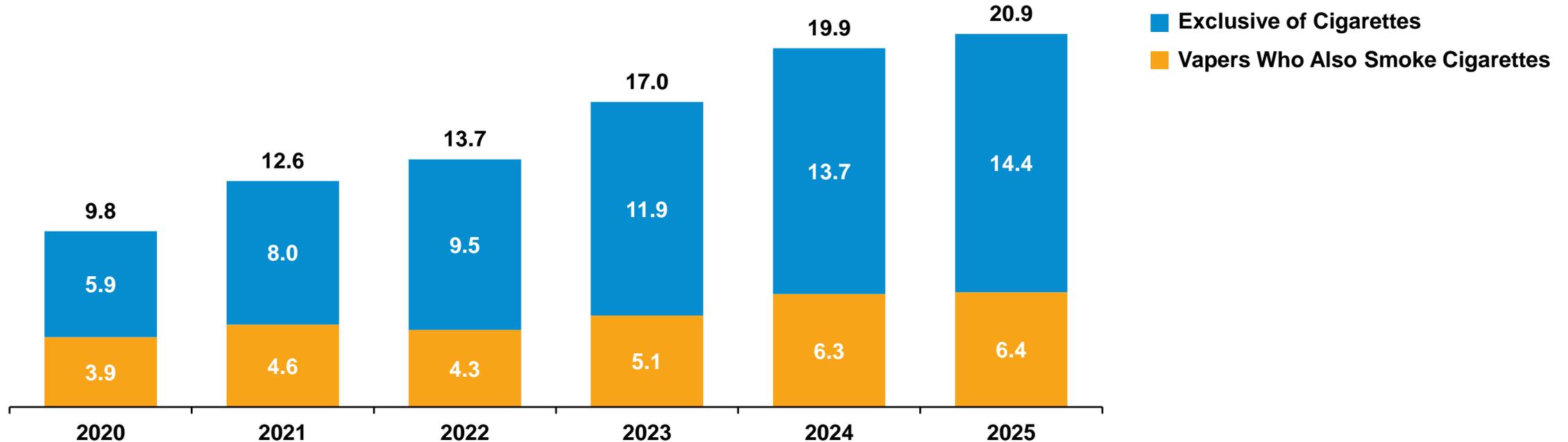
**Proportion of ATC Subgroups Using Exclusive Smoke-free, Exclusive Smokeable, or Dual of Both**  
 Source: ATCT (6 Moving-Month Distribution)



Source: Age 21+, ATCT (6m distribution) RA Jul 2017 to Sep 2025. Numbers may not foot due to rounding. %'s computed on population weights HNB has data only from Jan 2020  
 OTPs include hookah, chew, pipe tobacco, etc. Exclusive use of OTPs is not included in base for analysis. Use of OTPs is considered in the count of product usage (as 'Other') in all analysis. Internal docket: 2025-AH-64  
 Examples of exclusive Smoke-Free include E-Vapor, Smokeless, Oral, and HNB. Examples of exclusive Smokeable include Cigarettes and Cigars.

# E-Vapor Is the Most Predominant Smoke-Free Category

**Adult\* Vapers Past 30-Day Usage**  
(in millions)



Note: Estimates are based on self-reported use of E-Vapor in the past 30 days. Self-reported product use trends may not correspond with changes in sales or shipment volume.

E-Vapor Exclusive: Using e-vapor exclusive of any other tobacco products. E-Vapor Dual/poly: Using e-vapor and at least one or more tobacco products.\*Age 21 or older.

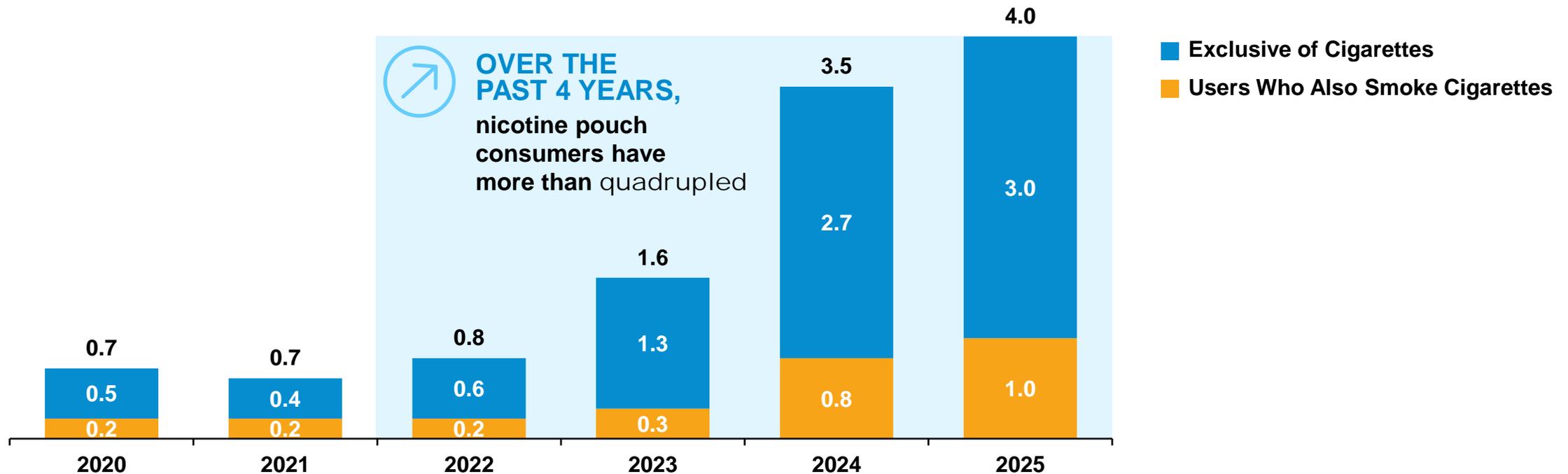
Source: \*Age 21+, ATCT RA 12MM ending December 2025. Percentages or numbers may add due to rounding.

Note that the exclusive of cigarette group may include dual users of other tobacco products, which for OTDN products is predominantly ST users and Vapers. Of the 14.4 million, 12.3 million are truly exclusive of all tobacco products and 1.1 million are dual/poly users of other tobacco products.



# Oral Nicotine Product Category is Rapidly Growing

**Adult\* Oral Nicotine Product Users Past 30-Day Usage**  
(in millions)



Note: Estimates are based on self-reported any use of OTDN in the past 30 days. Self-reported product use trends may not correspond with changes in sales or shipment volume.

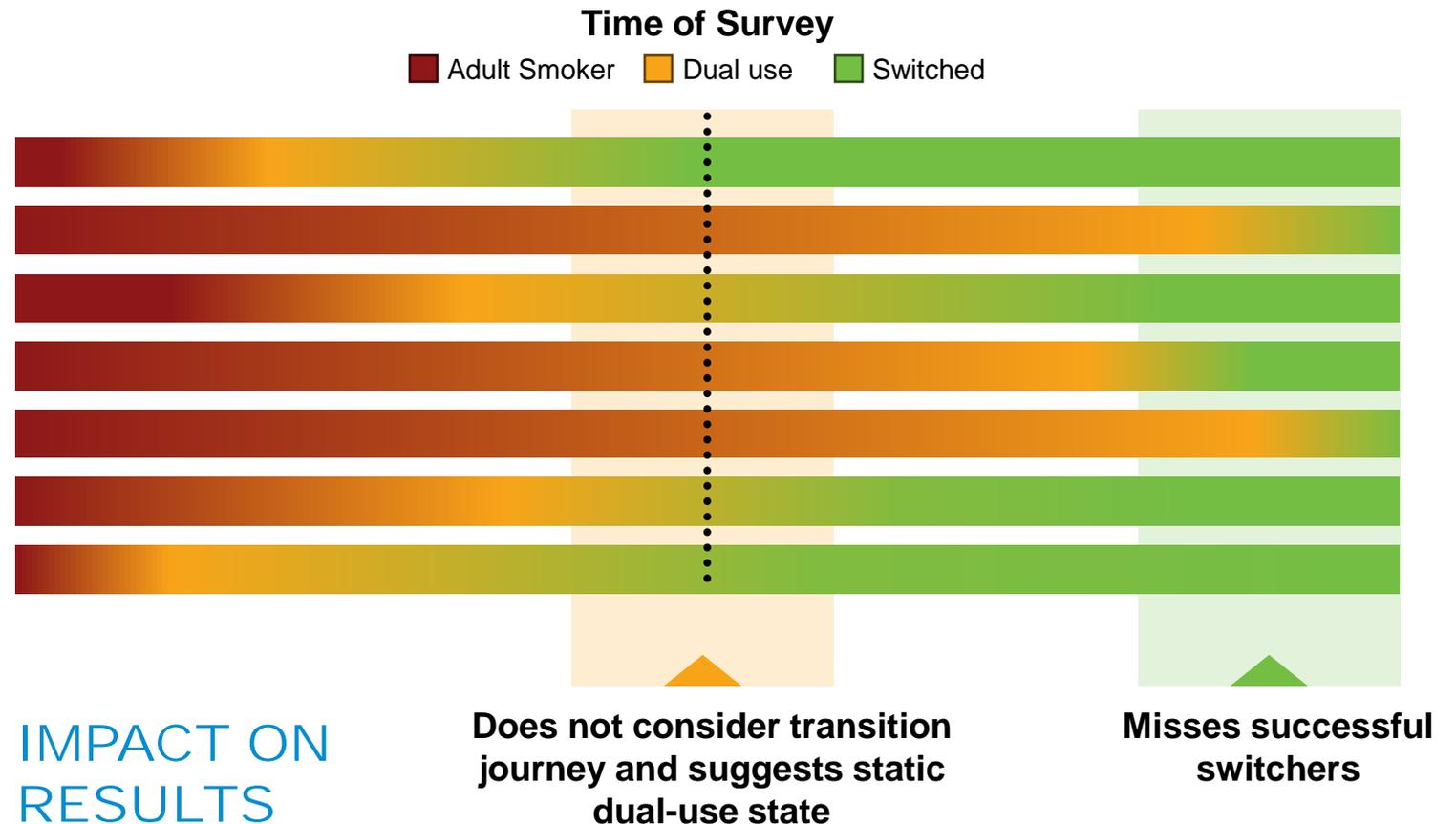
Exclusive users defined as using only oral nicotine products exclusive of any other tobacco products. \*Age 21 or older. Results are based on population weights.

Source: ATCT RA 12MM ending December 2025. Percentages or numbers may add due to rounding. Oral nicotine products that are free of tobacco leaf., including nicotine pouches, lozenges and gum.

Note that the exclusive of cigarette group may include dual users of other tobacco products, which is predominantly ST users and Vapors – Of the 3.0 million, 1.7 million are truly exclusive of all tobacco products and 1.3 million are dual/poly users of other tobacco products.

# Selection Bias From Incomplete "Capture"

Defining "dual use" cross-sectionally (i.e. based on what they were using at the time of the survey) will categorize these people differently, even though many will eventually switch



Slide adapted from Dr. Arielle Selya presentation at the Tobacco Research Science Conference, Knoxville, TN. Sept. 16, 2025

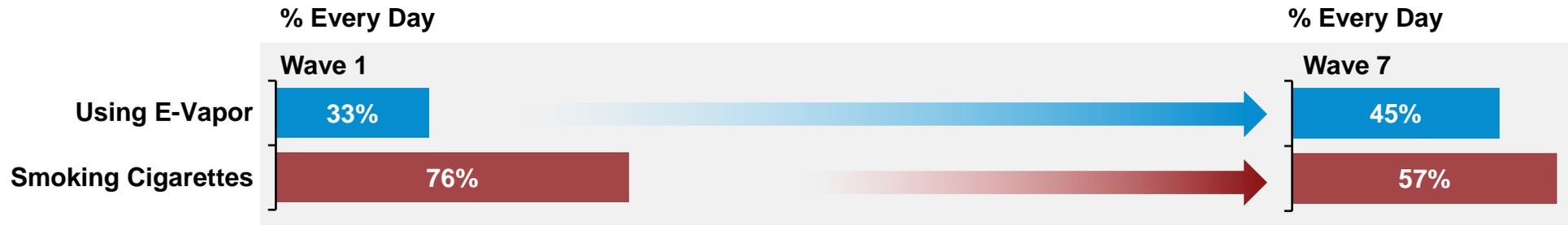
# Segmenting Dual Users by Frequency of Product Use

		CIGARETTE USE BEHAVIOR	
		Frequency	
E-VAPOR USE BEHAVIOR	≥20 days	<b>Frequent Duals</b>	<b>Vapers Who Smoke</b>
	<20 days	<b>Smokers Who Vape</b>	<b>Infrequent Duals</b>

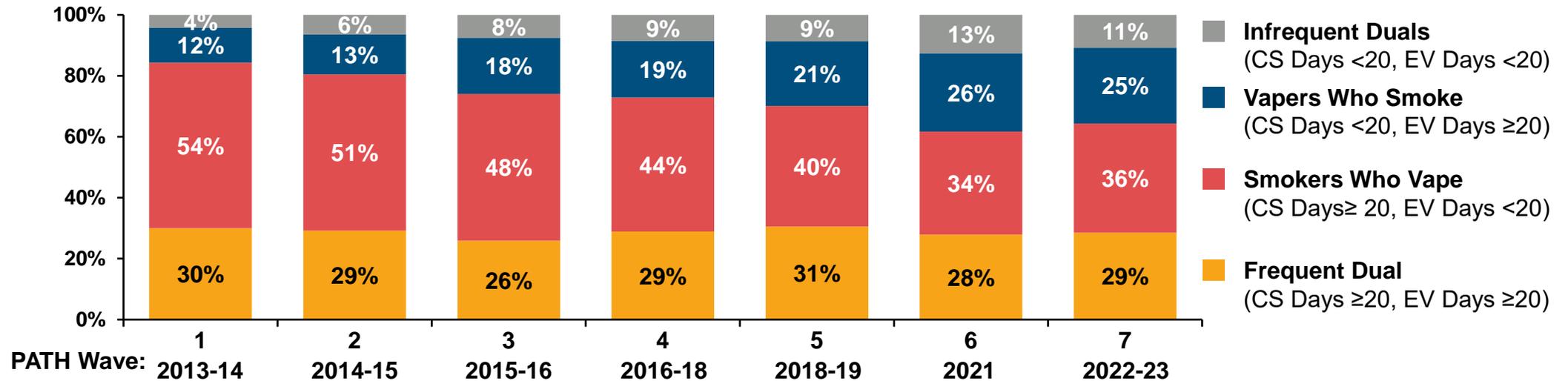
# Changes in Cigarette and E-Vapor Dual Use Patterns

## Cross-Sectional Analysis of PATH Wave 1 to Wave 7 Data

### Cigarette and E-Vapor Dual Use Group



### Proportion of Dual User Segment (Cigarette and E-Vapor Dual Group)



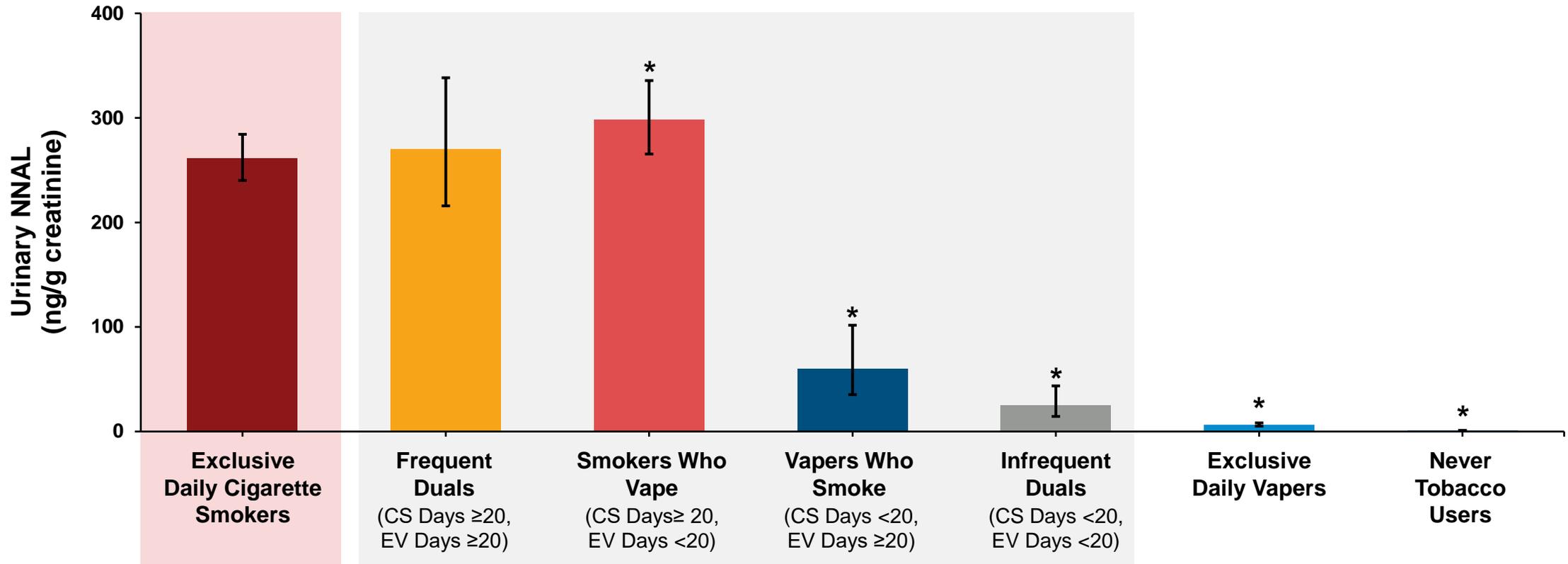
ALCS Cross-Sectional Analysis of PATH Wave 1 to Wave 7 Adult (18+) Data.

Established (100+ cigarettes lifetime criteria + having used e-vapor fairly regularly) Dual User Group Sample Sizes: Wave 1 n=680; Wave 2 n=802; Wave 3 n=687; Wave 4 n=784; Wave 5 n=915; Wave 6 n=639; Wave 7 n=719.



# Biomarkers of Exposure Provides Quantitative View

## Reduction in Exposure to NNK Corresponds to Smoking Frequency



Lizhnyak PN, Noggle B, Wei L, Edmiston J, Becker E, Black RA, Sarkar M. Harm Reduction J. 2022 Aug 17;19(1):90.

Abbreviation: NNAL: 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; NNK: 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone

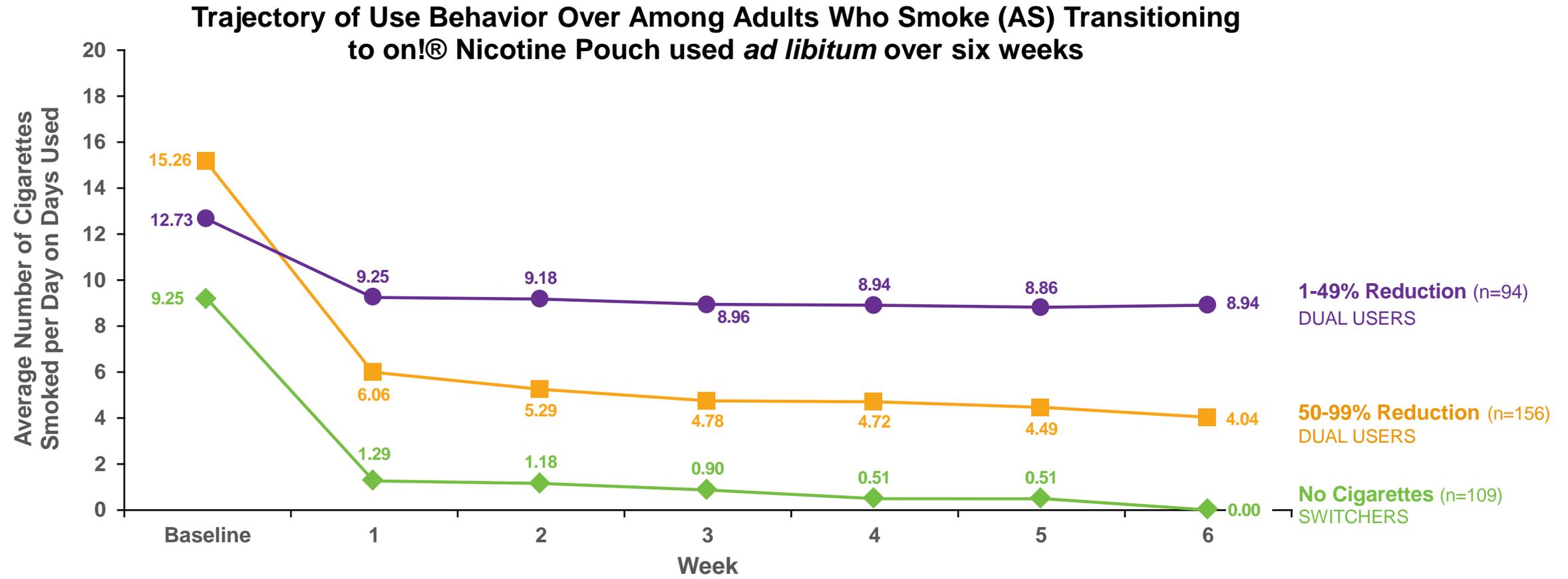
Note: \* - denotes statistically significant difference (p<0.05) when compared to exclusive cigarette smokers.

Analysis based on Wave 1 Adult Questionnaire Restricted-Use Files and Biomarker Restricted-Use Files (2013-2014).

Sample size: Exclusive Daily Cigarette Smoker (n=2442); Frequent Duals (n=169); Smokers Who Vape (n=678); Vapers Who Smoke (n=57); Infrequent Duals (n=66); Exclusive Daily Vapers (n=169); Never Tobacco Users (n=1,700)



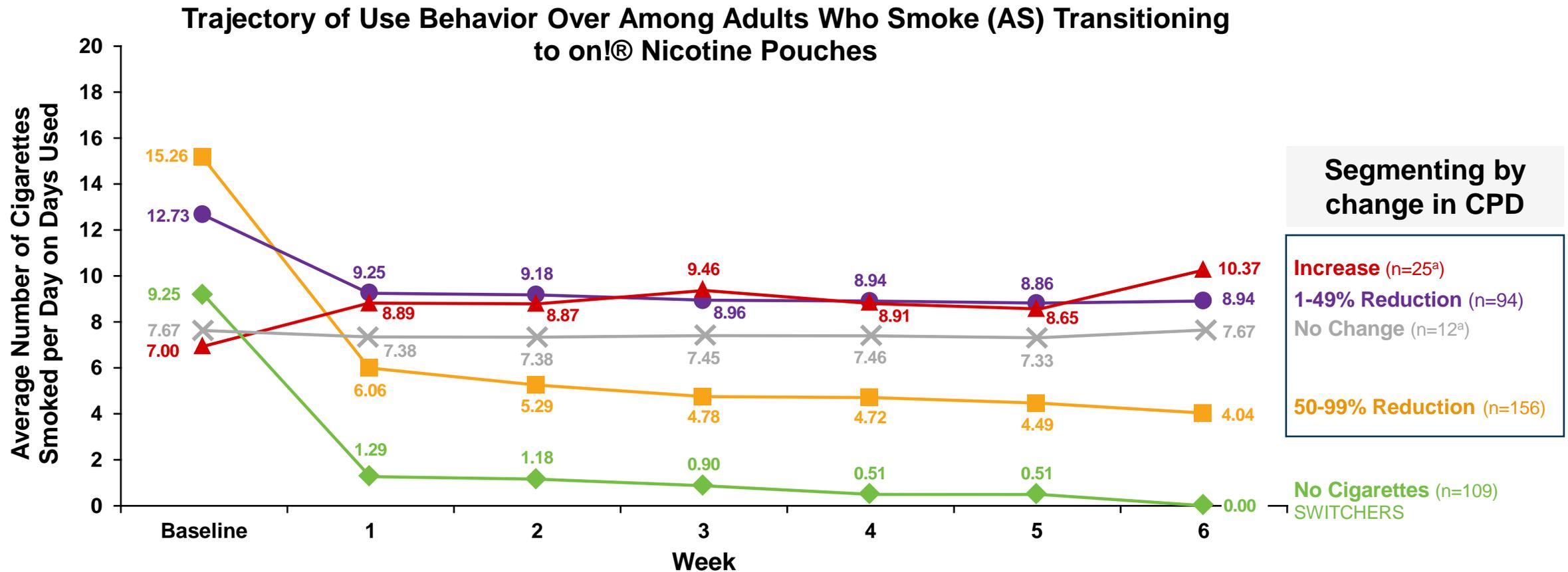
# Transition Journeys from Cigarettes to Nicotine Pouches Vary Between Individuals



Becker E, McCaffrey S, Lewis J, Vansickel A, Larson E, Sarkar M. Characterization of *Ad Libitum* Use Behavior of On! Nicotine Pouches. *Am J Health Behav.* 2023;47(3):428-449

<sup>a</sup>Caution: small sample size.  
 Note: Cigarette consumption in this figure was calculated only among those participants who reported using on! nicotine pouches during Week 6.

# Segmenting Dual Use by Smoking Intensity



<sup>a</sup>Caution: small sample size.

Note: Cigarette consumption in this figure was calculated only among those participants who reported using on! nicotine pouches during Week 6.

Becker E, McCaffrey S, Lewis J, Vansickel A, Larson E, Sarkar M. Characterization of *Ad Libitum* Use Behavior of *On!* Nicotine Pouches. *Am J Health Behav.* 2023;47(3):428-449.

# Longitudinal Assessment of Adult Cigarette Smokers Who Transition to ENDS

## DATA SOURCE

PATH Waves 1-5 RUF Biomarker Core

## STUDY GROUPS

Adults 18+ Exclusive Established Cigarette Smokers who switched to ENDS, dual used, or quit smoking

## OUTCOME MEASURES

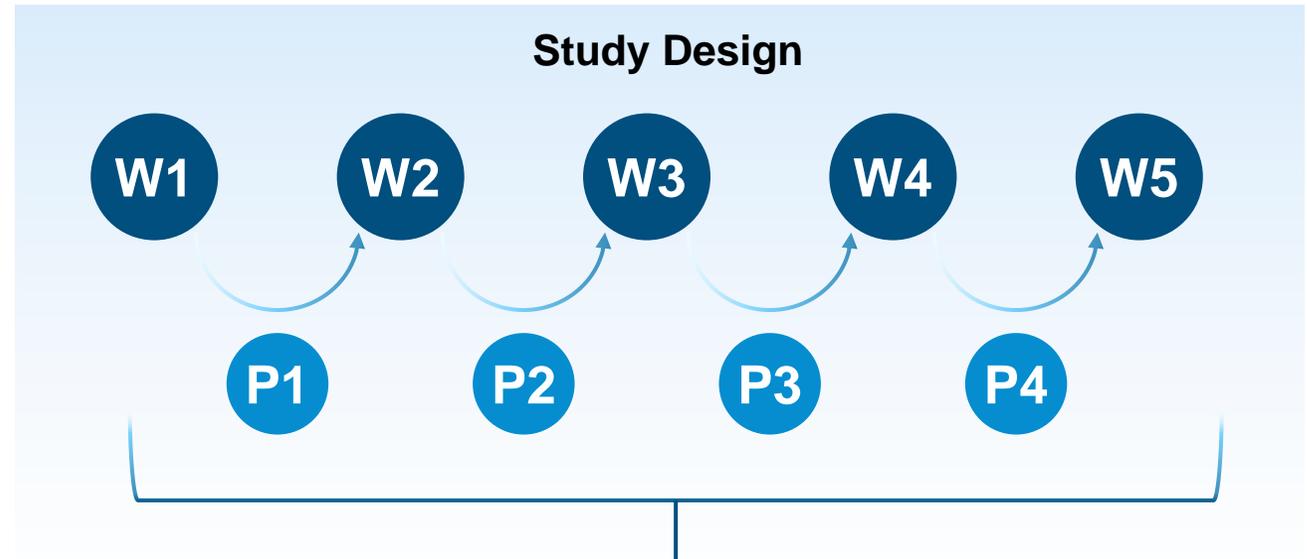
Biomarkers of Exposure (BOE)

## MODEL

Generalized Estimating Equations (GEE)

## COVARIATES

Age, sex, race and ethnicity, education, cigarettes per day, time (survey wave), and subject-specific correlations

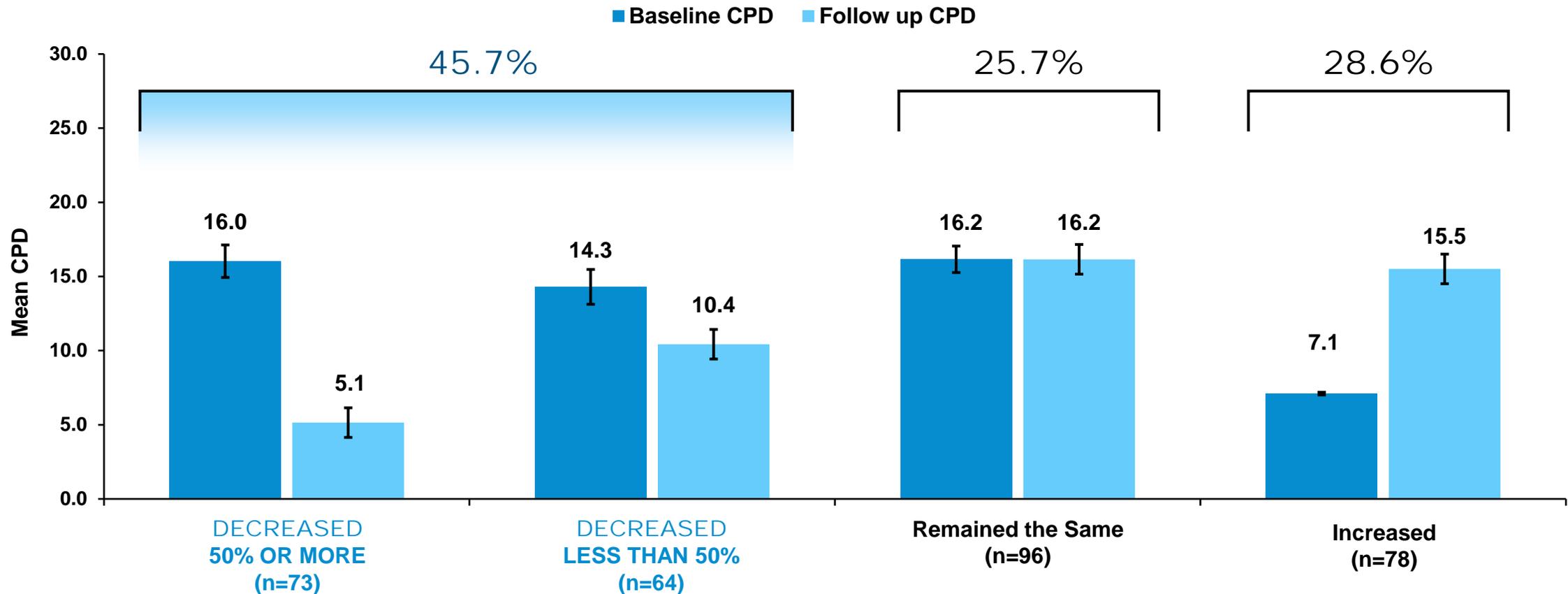


Tobacco User Group	Abbr.	Number of Observations
Exclusive Established Cigarette Smokers	CS	5,178
Exclusive Established ENDS Users	AE	79
<b>Exclusive Established Dual Users</b>	<b>ADU</b>	<b>311</b>
Former Smokers (no past 30-day tobacco use)	AQ	544



# Characterizing Changes in CPD Among DU Subgroups

Change in Cigarette Consumption from Baseline to Follow-up Among Adults Who Dual Use (ADU), Grouped by CPD Change

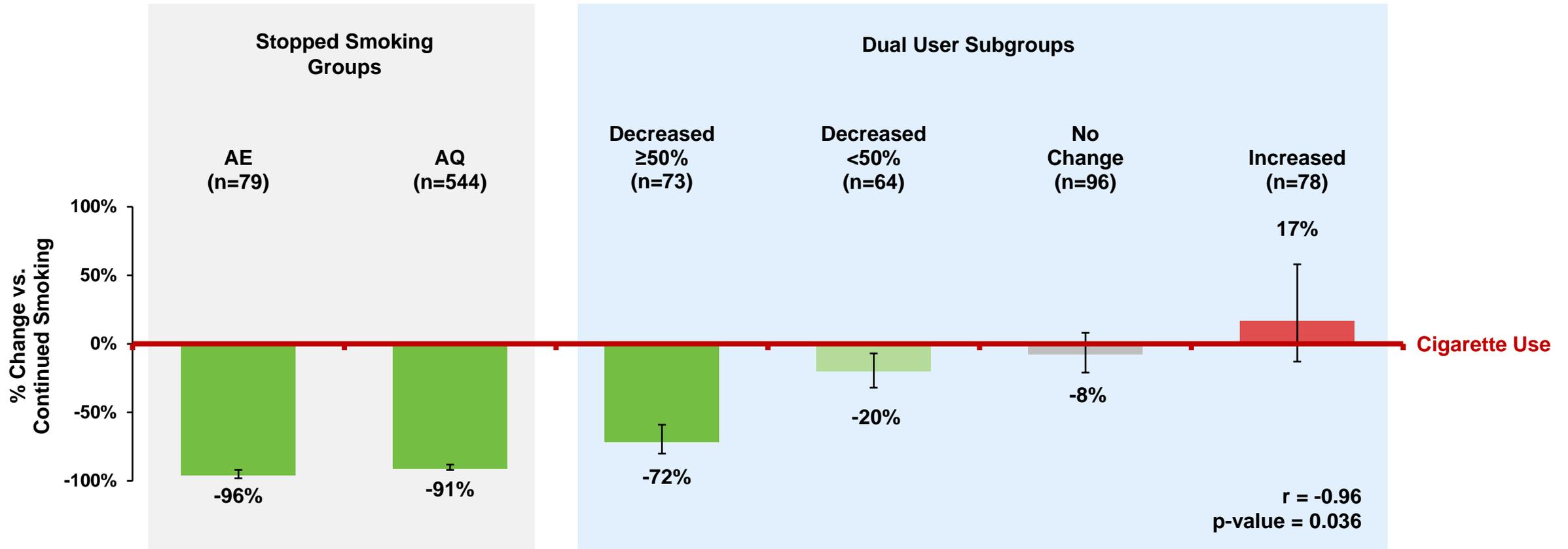


Based on longitudinal assessment of adults (18+) who were exclusive established cigarette smokers and transitioned to different levels of use of ENDS from PATH Waves 1-5 RUF Biomarker Core Dataset. The analysis was conducted using Generalized Estimating Equations and adjusting for covariates (Age, sex, race and ethnicity, education, cigarettes per day, time (survey wave), and subject-specific correlations).



# Meaningful Reduction in Exposure in Some Dual User Subgroups

Changes in NNAL vs. Continuing Smoking



Abbreviations: **NNAL**: 4-(methylnitrosamino)-1-1(3-pyridyl)-1-butanol; AE – Exclusive Established ENDS Users; AQ – Former Smokers (no past 30-day tobacco use); ADU – Exclusive Established Cigarette Smoking and ENDS Users; CPD – Cigarettes Per Day

# Substantial Reduction in CPD ( $\geq 50\%$ ) May Reduce Disease Risks

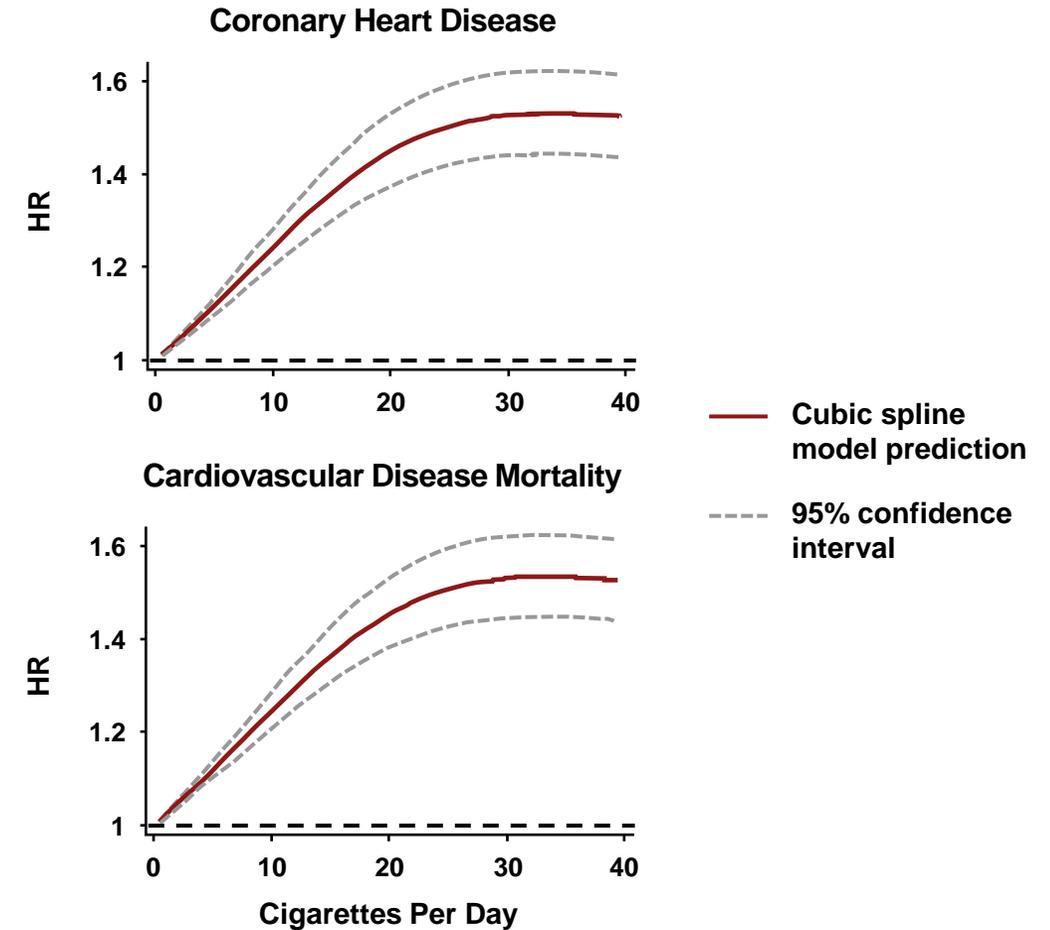
Health Outcome	Reduction Category	N	Relative Risk (95% CI)
Lung Cancer Risk	$\geq 50\%$	2	<b>0.72</b> (0.52, 0.91)
	Heavy to Moderate	3	<b>0.66</b> (0.46, 0.85)
	Heavy to Light	3	<b>0.60</b> (0.49, 0.72)
All CVD (mortality and incidence)	$\geq 50\%$	4	1.05 (0.89, 1.21)
	Heavy to Moderate	4	0.81 (0.60, 1.02)
	Heavy to Light	4	<b>0.78</b> (0.67, 0.89)
All-cause mortality	$\geq 50\%$	1	1.02 (0.91, 1.13)
	Heavy to Moderate	1	<b>0.63</b> (0.56, 0.71)
	Heavy to Light	1	<b>0.72</b> (0.66, 0.79)

**Heavy smokers:**  $\geq 20$  CPD  
**Moderate smokers:** 10–19 CPD  
**Light smokers:**  $< 10$  CPD

0 0.5 1 1.5

CI – Confidence Interval; CPD – Cigarettes Per Day; CVD – Cardiovascular Disease; N – Number of Studies

Chang JT, Anic GM, Rostron BL, Tanwar M, Chang CM. Cigarette Smoking Reduction and Health Risks: A Systematic Review and Meta-analysis. *Nicotine Tob Res.* 2021 Mar 19;23(4):635-642.



Tasdighi E, Yao Z, Dardari ZA, Jha KK, Osuji N, Rajan T, et al. (2025) Association between cigarette smoking status, intensity, and cessation duration with long-term incidence of nine cardiovascular and mortality outcomes: The Cross-Cohort Collaboration (CCC). *PLoS Med* 22(11): e1004561.





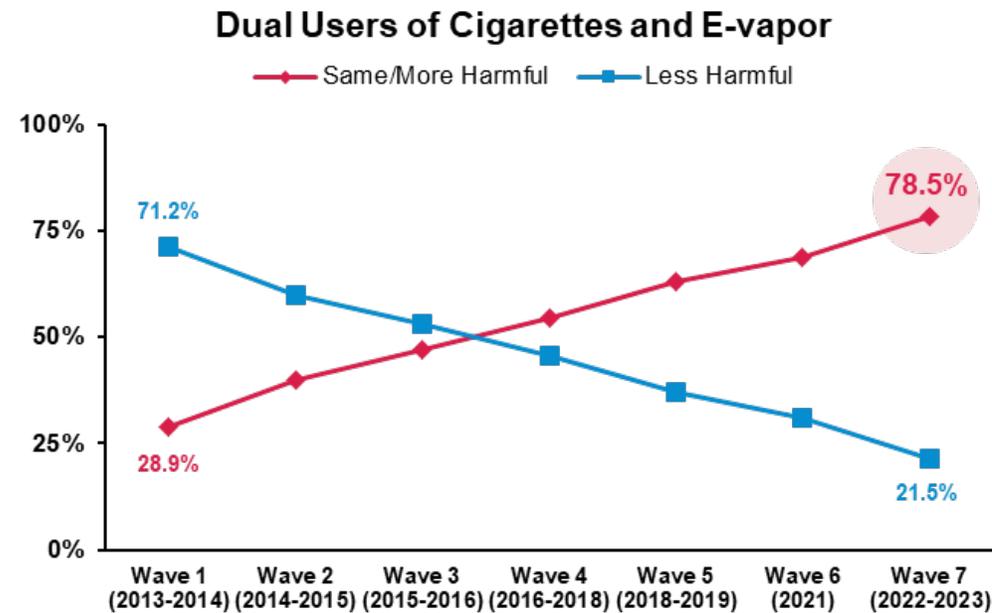
# Key Takeaways

- ✓ Dual users are not a monolithic group  
**Transition from cigarettes to smoke-free products is unique for each individual**
- ✓ Dual users can be segmented by frequency of product use or smoking intensity  
**Segmenting by smoking intensity informs exposure and potential risk reduction**
- ✓ Some dual user subgroups will experience substantial reduction in exposure  
**While this exposure reduction may reduce disease risk in some, complete switching has higher likelihood of disease risk reduction compared to continued smoking**



# Implications

- ✔ Opportunities exist to accelerate transition from dual use to complete switching  
**Correcting product risk and nicotine misperceptions can facilitate this transition**



Question asked: "Is using e-cigarettes or other electronic nicotine products less harmful, about the same, or more harmful than smoking cigarettes?"  
Based on ALCS analysis of PATH data. Definition of use status: Current dual users of cigarettes and e-vapor: Individuals who currently smoke cigarettes (having smoked 100+ cigarettes) and use e-vapor every day or some days.





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