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## Disclosures

Tobacco Industry	E-cigarette & nicotine product industry	Pharma Industry
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# Associations between daily vs. non-daily use of cigarettes and ENDS and transitions in product use in adults 2021–2022

TCORS

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## Introduction

- Electronic nicotine delivery systems (ENDS) and their patterns of use (exclusively, or with cigarettes) continue to evolve.
- Dual use of cigarettes and e-cigarettes is becoming increasingly prevalent. There is high heterogeneity in who is dual using and how they are using (frequency, intensity).
- Dual use can be a temporary state as a transition from cigarette smoking to e-cigarette-only use, but can be sustained use of both products
- Previous work has identified differences in transition propensities depending on daily vs non-daily use of cigarettes and ENDS, including for propensity to quit cigarettes.
- We updated estimates of associations between frequency of use and transition propensity, analyzing recently available nationally representative data.

## Data

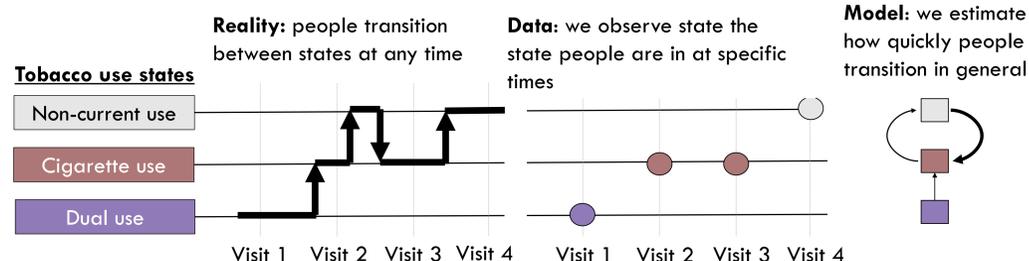
### PATH Study

- Nationally representative longitudinal cohort study
- 2021–22 (Waves 6–7): 23,803 adults
- Our tobacco use state variables are derived from questions about:
  - Established use of cigarettes or ENDS
  - Past-30-day use of cigarettes and ENDS
- Covariates: gender, age group, and race and ethnicity
- Incorporate longitudinal participant weights

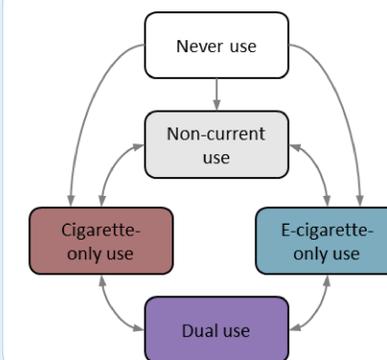
## Methods

### Multistate Markov Transition Model Framework

Markov transition models are continuous time stochastic processes models.



### State Transitions

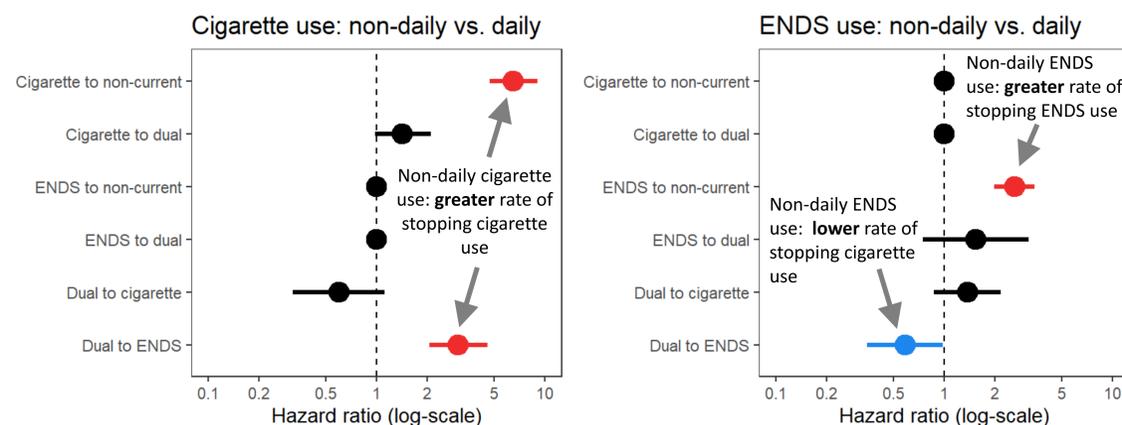


### Analysis

- We estimated associations between daily vs. non-daily use of cigarettes and ENDS and product use transitions rates, adjusting for gender, age group, and race and ethnicity.
- We estimated one-year transition probabilities for each combination of daily and non-daily use of cigarettes and ENDS

## Results

### Adjusted hazard ratios



## Key Findings

There is an **important challenge** in the use of ENDS as pathway to nicotine product cessation: successful cigarette cessation for those using both products is more likely for those frequently using ENDS, but frequent ENDS use is a barrier to ENDS cessation for those using ENDS only.

### Estimated 1-year transition probabilities

	To	Daily cigarette, daily ENDS				Non-daily cigarette, daily ENDS				Daily cigarette, non-daily ENDS				Non-daily cigarette, non-daily ENDS			
		Non-current use	Cigarette-only use	ENDS-only use	Dual use	Non-current use	Cigarette-only use	ENDS-only use	Dual use	Non-current use	Cigarette-only use	ENDS-only use	Dual use	Non-current use	Cigarette-only use	ENDS-only use	Dual use
From	Cigarette-only use	4.9	87.2	1.1	6.8	28.4	59.5	4.8	7.4	5.0	87.8	0.6	6.6	28.7	60.0	2.8	8.4
	ENDS-only use	16.4	1.6	76.2	5.8	16.6	0.9	77.9	4.7	39.6	2.9	51.3	6.2	40.0	1.7	52.4	5.8
	Dual use	2.9	27.9	18.1	51.2	8.4	10.8	48.6	32.2	4.1	38.7	8.3	48.8	13.5	17.6	26.1	42.9