



# FDLI Nicotine and Harm Reduction

**Joe Murillo**  
**Chief Regulatory Officer Juul Labs**

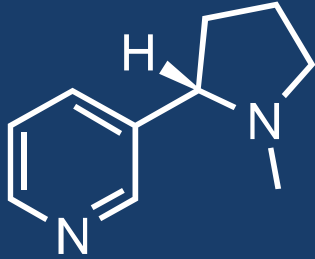


Juul Labs exists to transition  
the world's one billion adult smokers  
from combustible cigarettes

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We pursue this mission while  
actively combatting underage use

# Role of Nicotine in Tobacco Products



**Nicotine is addictive and can be harmful  
but is delivered on a continuum of risk**

## **DON'T START**

If you do not use  
nicotine, do not start

## **QUIT**

If you smoke  
cigarettes, quit

## **SWITCH**

If you are unable or  
unwilling to quit,  
switch to a less  
harmful alternative

# FDA's Comprehensive Plan for Tobacco and Nicotine Regulation



*“Nicotine, though not benign, is not directly responsible for the tobacco-caused cancer, lung disease, and heart disease that kill hundreds of thousands of Americans each year”*

– Former FDA Commissioner Gottlieb and CTP Director Zeller



# Misperceptions About Nicotine

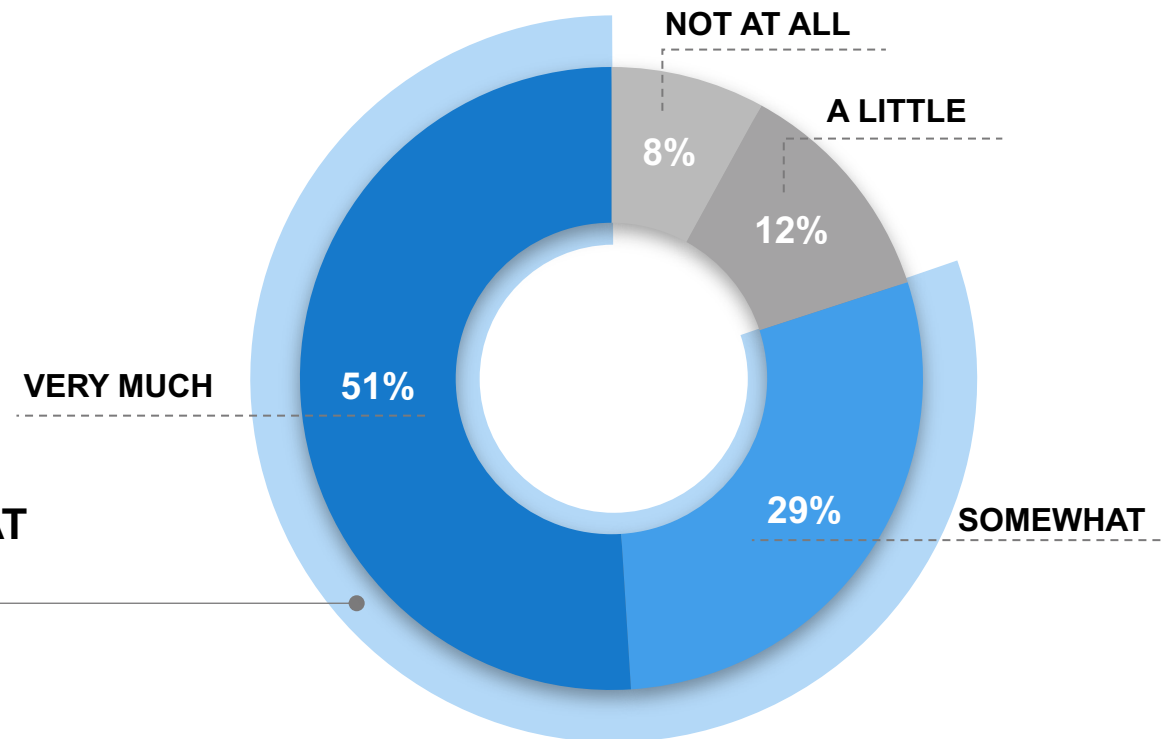


PATH Study: Nicotine and cancer perceptions among U.S. adults



“To what extent, if at all, do you believe that the nicotine in cigarettes to be the chemical that causes most of the cancer caused by smoking?”

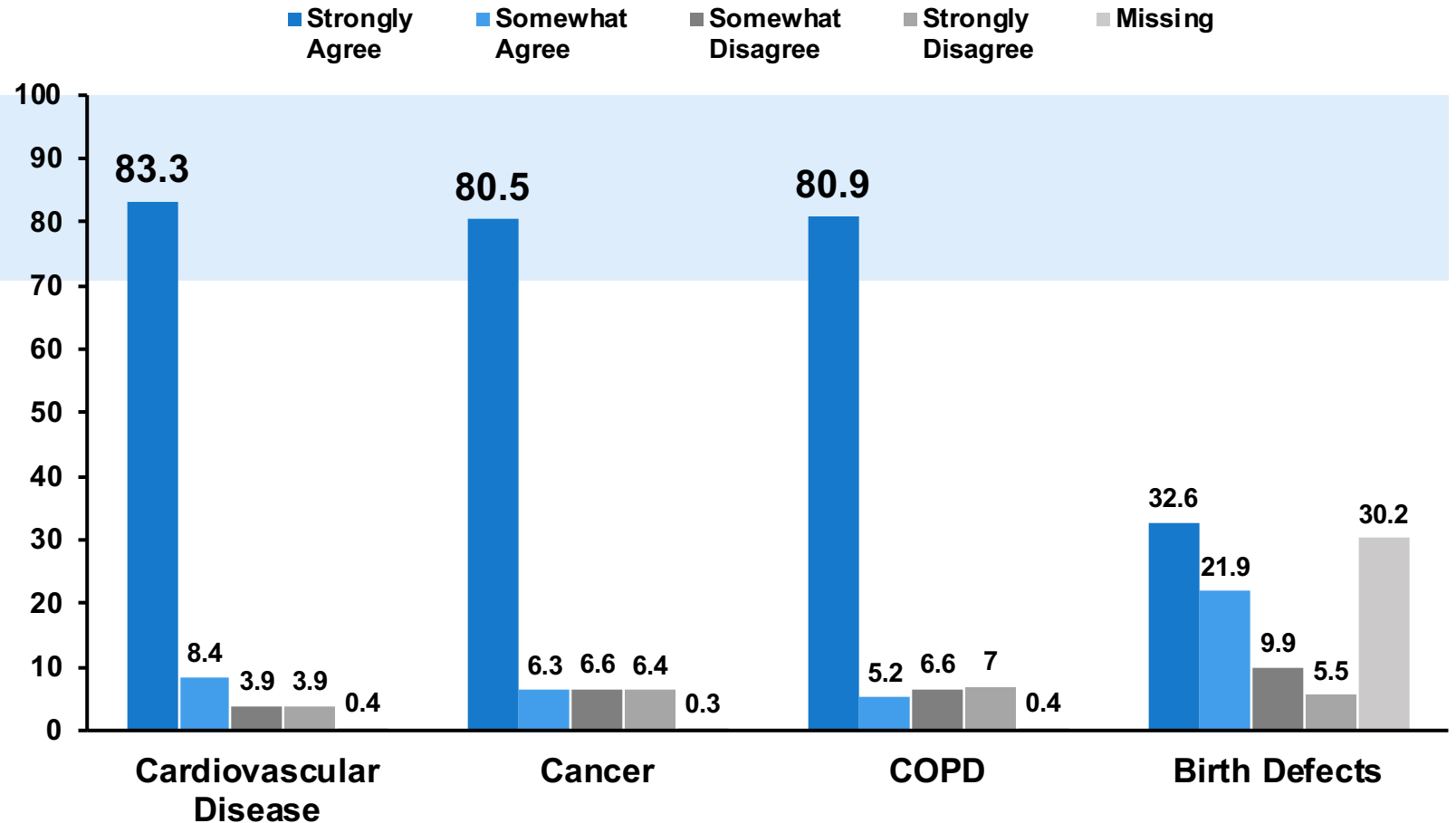
**80%** INCORRECTLY BELIEVE THAT NICOTINE CAUSES CANCER



# Misperceptions About Nicotine Amongst Physicians

**>80%** of specialties\* surveyed (N=1020)

**BELIEVE**  
“nicotine directly  
contributes to”  
cardiovascular disease,  
cancer, and COPD



\*Family medicine, internal medicine, OB/GYN, cardiology, pulmonary/critical care, and hematology/oncology

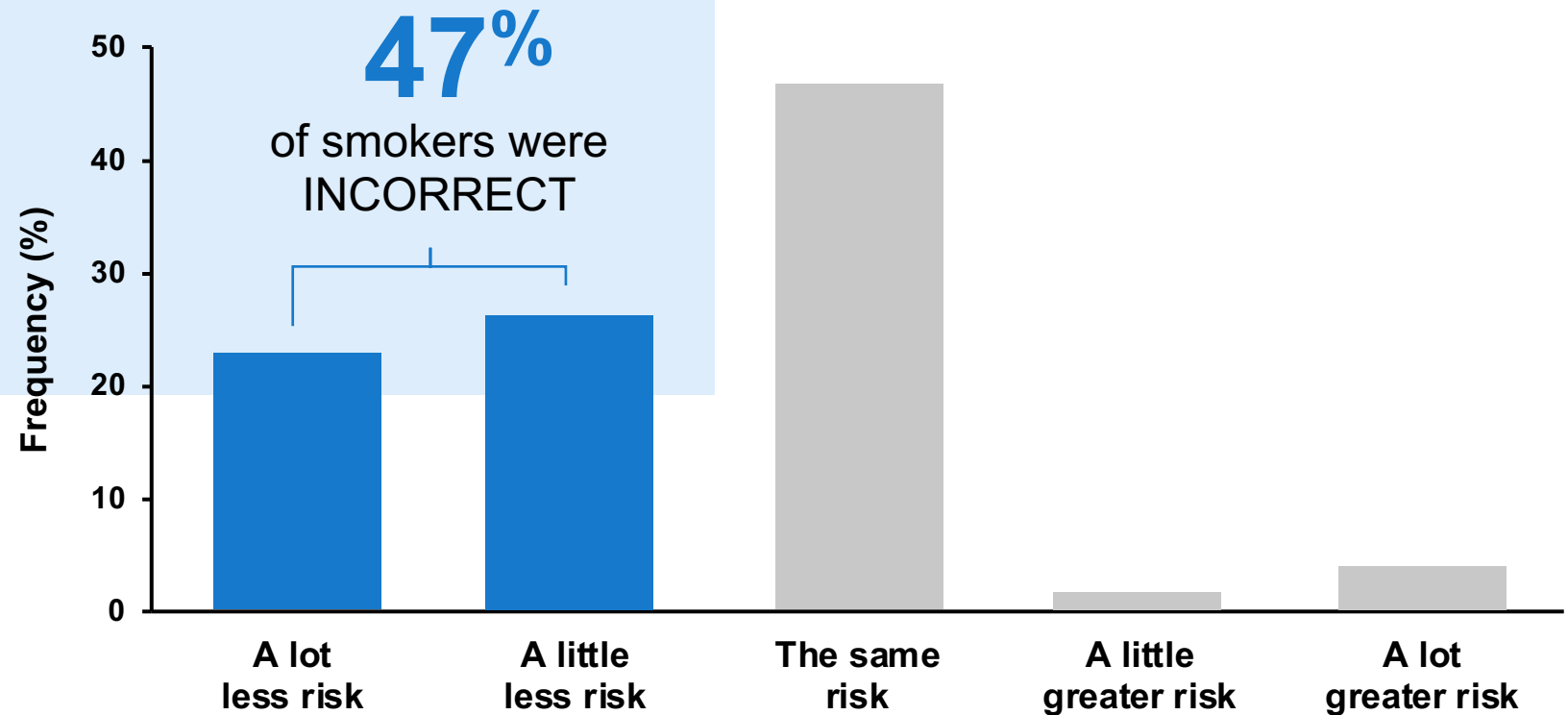
Steinberg, M.B., Bover Manderski, M.T., Wackowski, O.A. *et al.* Nicotine Risk Misperception Among US Physicians. *J GEN INTERN MED* (2020). <https://doi.org/10.1007/s11606-020-06172-8>

# Misperceptions About VLNC Cigarettes

Undermine the Comprehensive Plan

Perceived risk compared to current cigarettes

“..smoking VLNC *instead* of current cigarettes for 30 years leads to *less risk of cancer*”



## Misperceptions Negatively Impact Switching

**10.5** MILLION  
Adult Dual Users

**~4.3** MILLION  
Thought e-cigarettes were the  
**SAME OR MORE HARMFUL**  
than combustible cigarettes



they had thought e-cigarettes were  
**LESS HARMFUL** than cigarettes

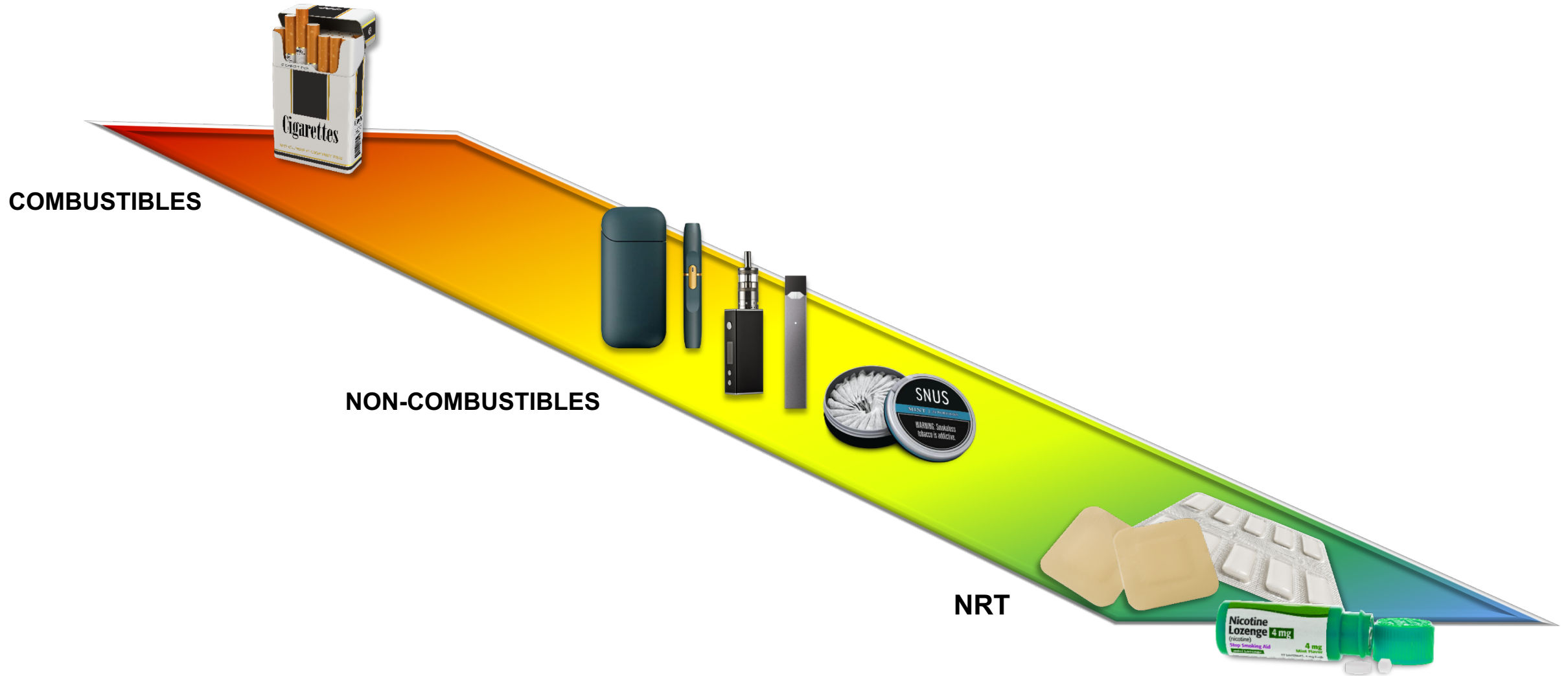
**115,000**  
Switched exclusively to e-cigarettes

**+** **~370,000** more

FIRST ORDER OF BUSINESS  
**PUBLIC EDUCATION**

1. Relative risks of different tobacco and nicotine products
2. Role of nicotine in tobacco-related disease

# Sliding Down The Risk Continuum



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In considering how to maximize population benefit and minimize population harm, one must fully consider **all three dimensions of nicotine products and locate the ‘sweet spot,’** which defines the characteristics of products most likely to displace smoking:

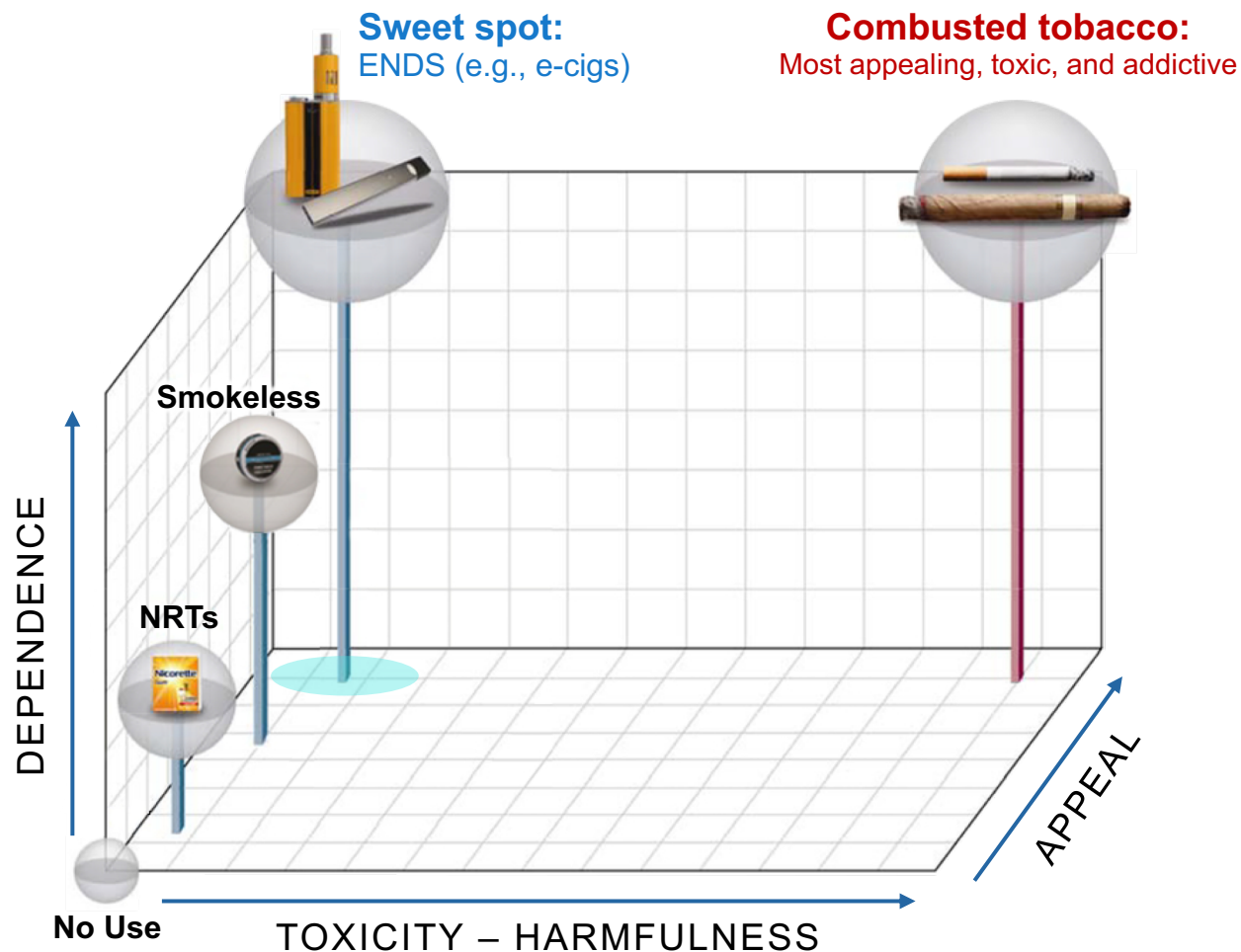
1. lower harm
2. sufficient appeal
3. sufficiently satisfying nicotine delivery

”

David B. Abrams, Ph.D., et al.

“Harm Minimization and Tobacco Control: Reframing Societal Views of Nicotine Use to Rapidly Save Lives” (2018)

## A Public Health Perspective: Less Harmful Alternatives Must Be Acceptable to Smokers





The data indicate that [IQOS] has addictive potential and abuse liability similar to [combustible cigarettes]. This is important as it signifies [IQOS] can provide an adequate nicotine source for dependent populations, including current CC users



– IQOS TPL

## Nicotine Delivery

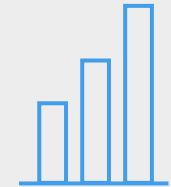
### Factors Impacting Nicotine Absorption



**Liquid and  
Device**

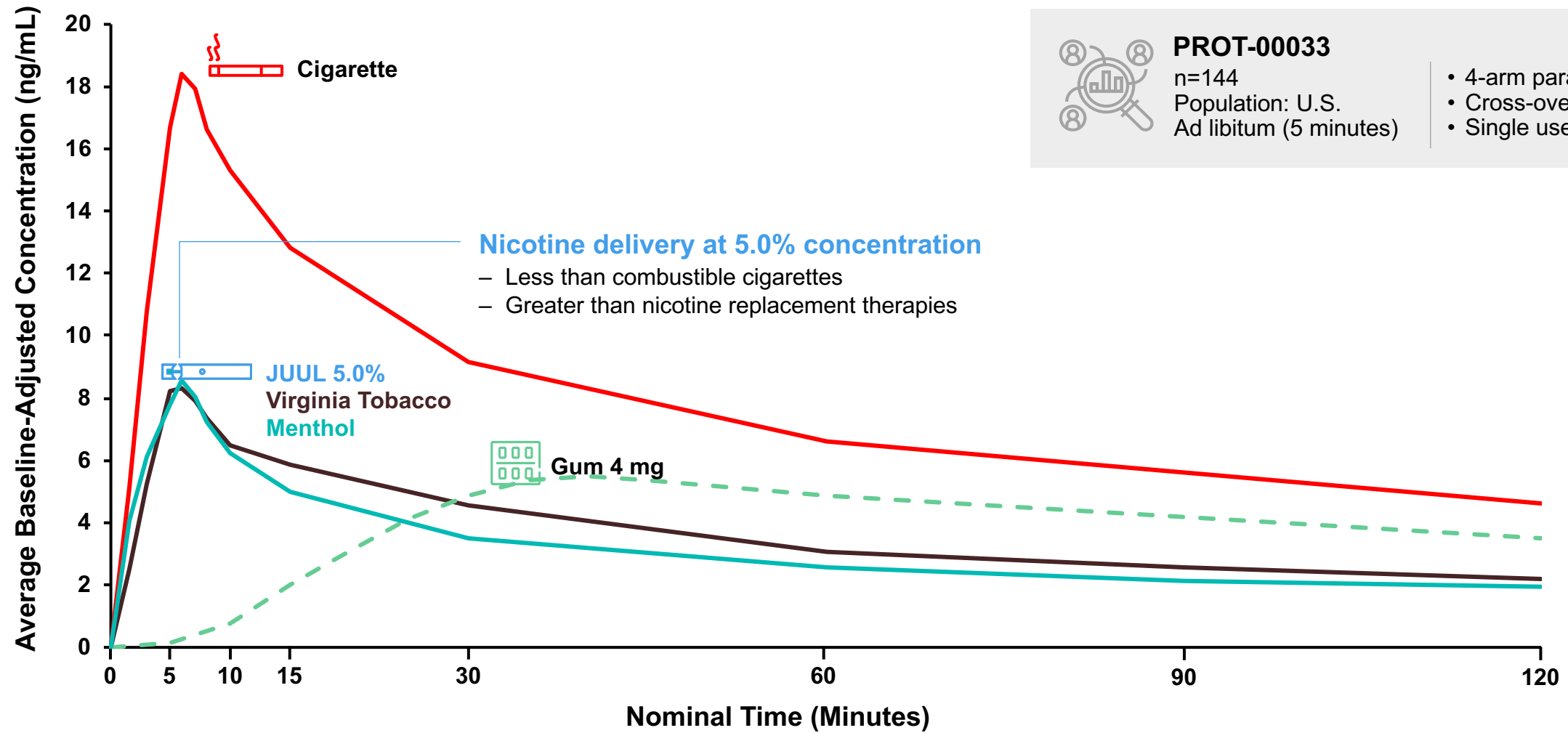


**User  
Behavior**



**Nicotine  
Concentration**

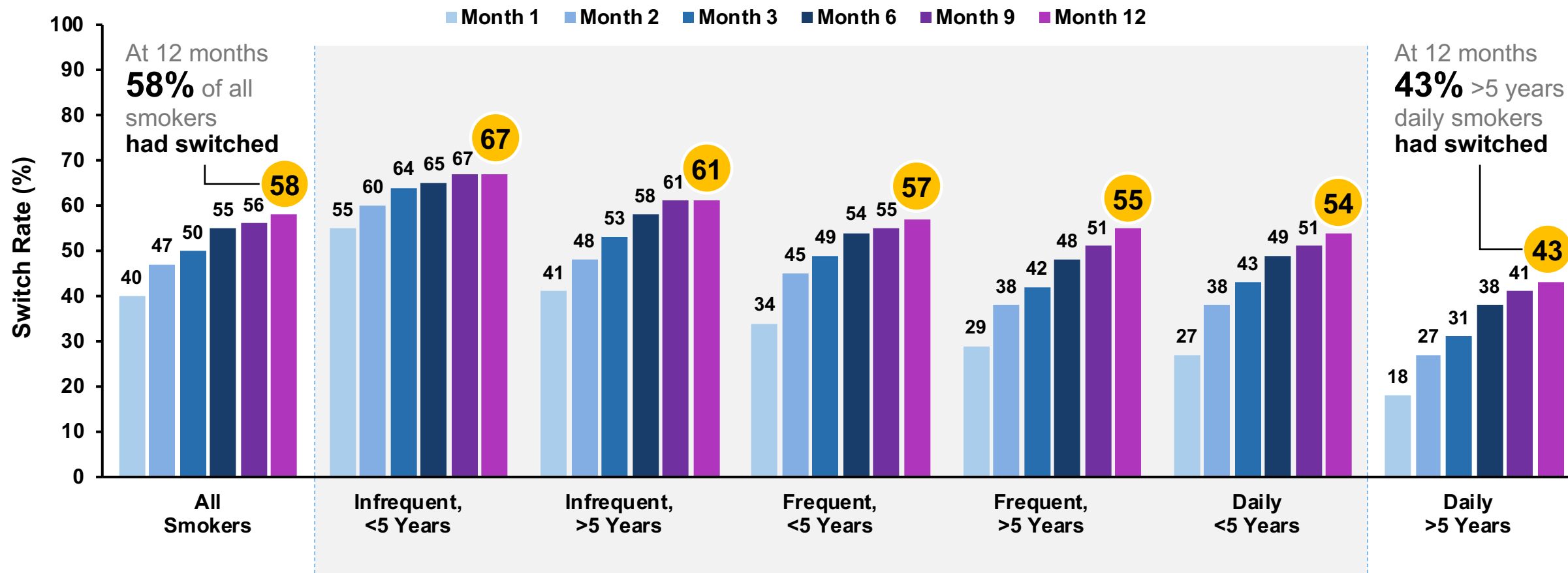
# JUUL System Delivers Nicotine to Satisfy and Switch Adult Smokers



Goldenson et. al "Pharmacokinetics and Pharmacodynamic Evaluation of JUUL Ends, Comparator ENDS, Combustible Cigarette, and Nicotine Gum Among Adult Smokers." Presented at College on Problems of Drug Dependence 2020 Annual Meeting



# Switching Rates Across Smoking History



**SWITCHING** = No smoking in the past 30 days *not even a puff*

# Comparative Switch Rates

## Switch rates among adult smokers

After accounting for relevant factors like demographics and smoking history

Lower in the  
United Kingdom

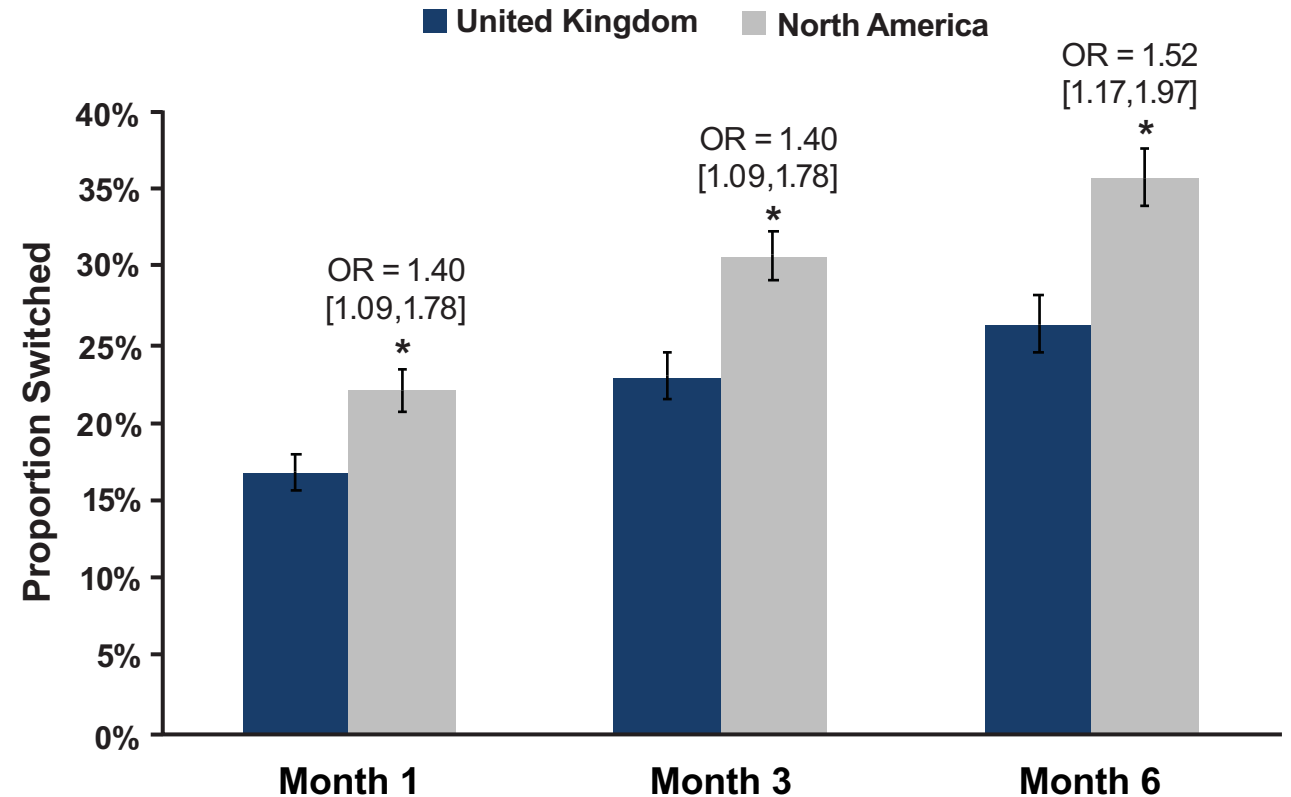


Higher in the  
US and Canada



where higher concentrations  
of nicotine are available

## Adjusted Switching Rates, Matched Samples



Proportion of Smokers in Propensity Matched Sample Reporting Complete Switching at 1-, 3- and 6-Month Follow-Up Assessments in North America and the United Kingdom ( $\pm$ SE)

Note. \*Significantly greater than United Kingdom ( $p < 0.05$ )

S.Shiffman, N.Goldenson, Y.Ding, S.Prakash, C.Hatcher, E.Augustson. "Differences in Rates of Adult Smokers Switching Away from Smoking Using JUUL System Products, Across Jurisdictions with Different Maximum Nicotine Concentrations (North America and the United Kingdom)." Presented 9/25/20 at the 3rd Scientific Summit on Tobacco Harm Reduction.

# Multiple Pathways in Support of a Continuum of Risk

## 1 CTP regulated tobacco products



Snus



Heated  
Tobacco



Closed Pod  
Systems



Open  
Systems



Oral  
Nicotine

## 2 CDER regulated nicotine medicines



Patch



Gum



Lozenges

The public needs to understand  
that **TOBACCO SMOKE**



—————> not nicotine <—————

**IS THE CAUSE OF SMOKING-RELATED  
MORTALITY AND MORBIDITY**

# Sliding Down The Risk Continuum

