

# Quantification of Risks and Benefits Associated with ENDS by Assessing Their Impact on Tobacco Use Transitions in the U.S.

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## Background

Electronic nicotine delivery systems (ENDS) can benefit combustible tobacco users if they switch completely to ENDS. ENDS use can also result in nicotine addiction among tobacco naïve people. To date, there has not been a quantification of these outcomes in a real-world setting. We assessed the impact of ENDS on tobacco use transitions among U.S. youth and adults.

## Methods

- We used weighted Population Assessment of Tobacco and Health Study (PATH) wave 4 (2016 - 2017) and 5 (2018 - 2019) adult and youth data, to understand transitions between combustible and electronic tobacco products.
- “Less harm” (benefit) was defined as combustible users completely transitioning to ENDS or combustible users quitting combustible products with the help of ENDS.
- We defined the following transitions as “more harm” (risk): those who use ENDS only adding or transitioning to combustible products, nonusers initiating ENDS with or without combustibles.

In the U.S., from 2016-2019, for every **1 beneficial** tobacco use transition, ENDS use was associated with **3.2 risky transitions** in the U.S.



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## Results

**Table 1: Transitions Associated with ENDS and Likely Reduce Population Harm**

Wave 4	Wave 5	n
Dual users	ENDS Only	469,351
Dual users	Nonusers*	4,796
Cigarette Only	ENDS Only	776,276
Cigarette Only	Nonusers*	22,653
Poly Users	ENDS Only	86,188
Poly Users	Nonusers*	2,285
ENDS+1	ENDS Only	96,577
ENDS+1	Nonusers*	0
Other Nonelectronic Combustibles	ENDS Only	205,785
Other Nonelectronic Combustibles	Nonusers*	8,043
<b>Total</b>		<b>1,202,603</b>

\*Wave 4 combustible users who tried ENDS to quit a combustible tobacco product and became a nonuser in wave 5.

**Table 2: Transitions Associated with ENDS and Likely Increase Population Harm**

Wave 4	Wave 5	n
ENDS Only	Dual Users	275,243
ENDS Only	Cigarette Only	185,745
ENDS Only	Poly Users	44,815
ENDS Only	ENDS+1	71,241
ENDS Only	Other Nonelectronic Combustibles	26,776
Nonusers	Dual Users	338,405
Nonusers	ENDS Only	2,654,378
Nonusers	Poly Users	68,970
Nonusers	ENDS+1	161,112
<b>Total</b>		<b>3,826,685</b>

## Conclusion

While ENDS may have some benefits for adults who smoke, they should be regulated to restrict access for tobacco naïve people.

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