S1 Appendix. E-Cigarette-Associated Δ Transition Probability of Cigarette Smoking Cessation

Let A equal a set of age groups. For age group $a \in A$, let $quit_{a,aid}$ equal the probability of cessation using pharmaceutical aids, $quit_{a,no\ aid}$ equal the probability of cessation not using pharmaceutical aids, $quit_{a,e\text{-}cig}$ equal the probability of cessation using e-cigarettes, $quit_{a,no\ e\text{-}cig}$ equal the probability of cessation not using e-cigarettes, and OR_a equal the odds ratio of cessation among current cigarette smokers interested in quitting who used e-cigarettes compared to those who did not use e-cigarettes. Pharmaceutical aids included: nicotine patch; nicotine gum or lozenge; nicotine containing nasal spray or inhaler; prescription pill such as Chantix, Varenicline, Zyban, Bupropion, or Wellbutron.

By definition, the odds ratio, OR_a, equals the ratio of (1) the ratio of the probability of cessation among current cigarette smokers interested in quitting who used e-cigarettes, $quit_{a,e\text{-}cig}$, and its complement (2) the ratio of the probability of cessation among current cigarette smokers interested in quitting who did not use e-cigarettes, $quit_{a,no\ e\text{-}cig}$ and its complement. Conservatively, we set $quit_{a,no\ e\text{-}cig}$ to equal $quit_{a,aid}$. Then, solving for $quit_{a,e\text{-}cig}$:

$$quit_{a,e\text{-}cig} = \frac{OR_a \times quit_{a,aid}}{1 - quit_{a,aid} + OR_a \times quit_{a,aid}}.$$

We then estimated the difference in the probability of cigarette smoking cessation at 6 months between current e-cigarette users and non-current e-cigarette users as the weighted average of (1) the difference in the probability of cessation using e-cigarettes ($quit_{a,e\text{-}cig}$) and the probability of cessation using a pharmaceutical aid ($quit_{a,aid}$) and (2) the difference in the probability of cessation using e-cigarettes ($quit_{a,e\text{-}cig}$) and the probability of cessation using no pharmaceutical aid ($quit_{a,no\ aid}$). The weight for (1) equaled the proportion of current cigarette smokers with a past-year quit attempt who used a pharmaceutical aid (p_a). The weight for (2) equaled 1 minus the proportion of current cigarette smokers with a past-year quit attempt who used a pharmaceutical aid ($1-p_a$).

$$\Delta \text{ prob. cessation}_a = p_a \times \left(quit_{a,e\text{-}cig} - quit_{a,aid} \right) + \left(1 - p_a \right) \times \left(quit_{a,e\text{-}cig} - quit_{a,no\ aid} \right)$$

27 S1 Table 1 presents parameter values for the estimation of the difference in the probability of cigarette

28 smoking cessation at 6 months between current e-cigarette users and non-current e-cigarette users, Δ

29 probability cessation$_a$.

S1 Table 1. Parameters for Estimation of Difference In The Transition Probability Of Cigarette Smoking Cessation At 6 Months Between Current E-Cigarette Users And Non-Current E-Cigarette Users (%)

Parameter	Notation	Age Range	Point Estimate (95% CI)	Source
Proportion Of Current Cigarette Smokers With a Past-Year Quit Attempt Who Used A Pharmaceutical Aid During Quit Attempt* (%)	p_a	25-34	25.9 (21.5, 30.2)	2010 NHIS
		35-49	39.5 (35.0, 44.0)	
		50-69	39.1 (34.4, 43.9)	
Probability of Cigarette Smoking Cessation ≥6 Months Among Current Cigarette Smokers Who Seriously Tried to Quit and Used A Pharmaceutical Aid During Quit Attempt (%)	$quit_{a, aid}$	25-34	8.1 (5.5, 10.8)	Messer et al.[1]
		35-49	9.3 (7.9, 10.6)	
		50-69	8.3 (6.6, 10.0)	
Probability of Cigarette Smoking Cessation ≥6 Months Among Current Cigarette Smokers Who Seriously Tried to Quit and Did Not Use A Pharmaceutical Aid During Quit Attempt (%)	$quit_{a, no\ aid}$	25-34	7.9 (6.9, 8.9)	Messer et al.[1]
		35-49	5.2 (4.5, 5.8)	
		50-69	6.4 (5.5, 7.3)	
Odds Ratio of Quitting Smoking Among Smokers with an Interest in Quitting	OR_a	25-69	0.86 (0.60, 1.23)	Kalkhoran & Glantz [2]

30 Note: CI=confidence interval; OR=odds ratio.

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35　　　　　Finally, we estimated the variance of Δ probability cessation$_a$ by performing the bootstrap method

36N=100,000 times. S1 Table 2 shows the point estimates and 95% confidence intervals of Δ probability

37cessation$_a$.

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S1 Table 2. Age-Group-Specific Point Estimate and 95% CI of Δ Probability Cessation (%)

Parameter	Notation	Age Range	Point Estimate (95% CI)
Difference In The Transition Probability Of Cigarette Smoking Cessation At 6 Months Between Current E-Cigarette Users And Non-Current E-Cigarette Users (%)	Δ prob. cessation$_a$	25-34	-0.92 (-3.73, 2.27)
		35-49	1.26 (-1.58, 4.11)
		50-69	0.05 (-2.55, 2.77)

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References

1. Messer K, Trinidad DR, Al-Delaimy WK, Pierce JP. Smoking Cessation Rates in the United States: A Comparison of Young Adult and Older Smokers. Am J Public Health. 2008;98: 317–322. doi:10.2105/AJPH.2007.112060

2. Kalkhoran S, Glantz SA. Modeling the Health Effects of Expanding e-Cigarette Sales in the United States and United Kingdom: A Monte Carlo Analysis. JAMA Intern Med. 2015;175: 1671–1680. doi:10.1001/jamainternmed.2015.4209