

Supplemental Table 1: PATH Study Waves 1-3: Numbers of Individuals and Numbers of Observations that Could Contribute to GEE Analyses Using the 'All-Waves' Weights.

Age group† in W1, W2, W3	Description	Contributes to adult vs. youth tables for each wave pair in GEE analyses using Waves 1-3		N individuals ¹	N observations ¹
		W1-W2	W2-W3		
AAA	Adults at all three waves	adult	adult	23,670	47,340
YYY	Youth at all three waves	youth	youth	7,595	15,190
YYA	Youth who aged into adults at W3	youth	youth	1,737	3,474
YAA	Youth who aged into adults at W2	youth	adult	1,714	1,714
SYY	Shadow youth who aged into youth at W2	does not contribute	youth	1,947	1,947
SSY	Shadow youth who aged into youth at W3	does not contribute	does not contribute	0	0
Notes: Abbreviations: W1= Wave 1; W2= Wave 2; W3= Wave 3; GEE = generalized estimating equation †Age group key: A = adult; Y = youth; S = shadow youth ¹ Unweighted numbers of individuals and number of observations used will vary by outcome and covariates included in a model. Maximum number of individuals for adult analyses (A + A) = 25,384 Maximum number of observations for adult analyses ((A X 2) + A) = 49,054 Maximum number of individuals for youth analyses (Y + Y + Y+ Y) = 12,993 Maximum number of observations for youth analyses ((Y X 2) + (Y X 2) + Y + Y) = 22,325					

Supplemental Table 2: Correlates of 'Reuptake' Among Previous Users (Youth 12-17) at Baseline.

Correlates at baseline	P30D use at follow-up																							
	Any Tobacco				Cigarettes				ENDS				Cigars				Hookah				Smokeless			
	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI
Overall	30.3	(28.4-32.3)	N/A	N/A	24	(21.5-26.7)	N/A	N/A	22.7	(20.6-24.9)	N/A	N/A	24.7	(21.7-28.0)	N/A	N/A	18.4	(16.2-20.9)	N/A	N/A	15.6	(12.6-19.2)	N/A	N/A
DEMOGRAPHIC CHARACTERISTICS																								
Age group																								
12-14	21.7	(18.5-25.2)	--	--	13.7	(10.6-17.5)	--	--	16.6	(13.1-20.8)	--	--	11.7	(6.6-19.9)	--	--	10.5	(6.7-16.2)	--	--	14.2	(9.4-20.8)	--	--
15-17	33.7	(31.4-36.1)	2.0	(1.6-2.4)***	27.7	(24.6-31.1)	2.3	(1.7-3.3)***	24.6	(22.4-27.0)	1.6	(1.2-2.1)**	26.9	(23.5-30.6)	2.8	(1.4-5.7)**	19.7	(17.2-22.4)	1.7	(1.0-2.9)*	16.1	(12.6-20.3)	1.2	(0.7-2.1)
Sex																								
Female	27.6	(24.9-30.5)	--	--	24.0	(20.5-27.9)	--	--	20.9	(18.0-24.2)	--	--	18.2	(14.5-22.6)	--	--	17.6	(14.5-21.2)	--	--	9.0	(5.5-14.4)	--	--
Male	32.9	(30.2-35.7)	1.3	(1.1-1.6)**	24.1	(20.7-27.9)	1.0	(0.7-1.3)	24.2	(21.7-26.9)	1.2	(0.9-1.5)	28.8	(25.0-32.8)	2.1	(1.5-3.0)***	19.5	(16.3-23.1)	1.1	(0.8-1.5)	18.4	(14.7-22.9)	2.4	(1.3-4.3)**
Race/ethnicity																								
Non-Hispanic White	33.4	(30.3-36.6)	--	--	25.8	(22.3-29.6)	--	--	25.8	(22.6-29.2)	--	--	26.4	(22.6-30.6)	--	--	19.4	(16.2-23.1)	--	--	NR	NR	NR	NR
Non-Hispanic Black	26.4	(21.6-31.8)	0.7	(0.5-1.0)*	20.3	(15.2-26.6)	0.8	(0.5-1.2)	17.1	(11.9-23.8)	0.6	(0.4-1.0)	19.1	(12.3-28.4)	0.7	(0.4-1.2)	19.4	(11.5-30.8)	1.2	(0.6-2.4)	NR	NR	NR	NR
Non-Hispanic Other (includes two or more races)	29.1	(23.7-35.2)	0.9	(0.6-1.2)	24.1	(17.5-32.1)	1.0	(0.6-1.7)	22.2	(16.6-29.1)	1.0	(0.6-1.5)	26.8	(17.9-38.2)	1.1	(0.6-1.9)	15.9	(10.1-24.2)	0.9	(0.5-1.7)	NR	NR	NR	NR
Hispanic	26.7	(23.7-29.9)	0.7	(0.6-0.9)**	21.1	(17.0-26.0)	0.8	(0.6-1.1)	18.0	(15.3-21.0)	0.7	(0.5-1.0)*	21.6	(16.8-27.2)	0.8	(0.6-1.1)	17.7	(14.2-21.9)	1.0	(0.7-1.4)	NR	NR	NR	NR
Sexual orientation (ages 14+)																								
Straight/Heterosexual	32.3	(30.0-34.8)	--	--	26.7	(23.7-29.9)	--	--	24.4	(22.0-26.9)	--	--	25.5	(22.0-29.3)	--	--	19.2	(16.8-22.0)	--	--	16.7	(13.0-21.1)	--	--
Other (includes gay, lesbian, bisexual, other)	31.6	(26.2-37.6)	1.2	(0.9-1.6)	24.7	(18.7-32.0)	1.0	(0.6-1.6)	20.5	(16.0-25.8)	0.8	(0.6-1.1)	26.3	(18.5-35.9)	1.3	(0.8-2.3)	14.5	(9.0-22.4)	0.6	(0.3-1.2)	#	#	#	#
TOBACCO USE CORRELATES																								
Use of cigarettes																								
No P30D use	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20.2	(18.2-22.5)	--	--	21.2	(18.1-24.6)	--	--	16.7	(14.3-19.4)	--	--	15.9	(12.2-20.3)	--	--
P30D use	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	33.6	(28.0-39.7)	1.6	(1.2-2.1)**	34.8	(28.7-41.5)	1.9	(1.3-2.8)***	24.4	(19.3-30.3)	1.5	(1.0-2.2)	14.6	(10.1-20.6)	0.8	(0.5-1.5)
Use of ENDS																								
No P30D use	N/A	N/A	N/A	N/A	22.0	(19.5-24.7)	--	--	N/A	N/A	N/A	N/A	23.6	(20.3-27.2)	--	--	18.4	(15.9-21.3)	--	--	15.1	(11.6-19.5)	--	--
P30D use	N/A	N/A	N/A	N/A	43.1	(34.0-52.6)	2.2	(1.4-3.3)***	N/A	N/A	N/A	N/A	30.0	(22.0-39.5)	1.1	(0.7-1.9)	18.7	(13.7-25.0)	0.9	(0.6-1.5)	17.8	(12.1-25.4)	1.2	(0.6-2.5)
Use of cigars																								
No P30D use	N/A	N/A	N/A	N/A	22.6	(20.0-25.4)	--	--	21.2	(19.0-23.4)	--	--	N/A	N/A	N/A	N/A	17.6	(15.1-20.4)	--	--	15.0	(11.8-18.7)	--	--
P30D use	N/A	N/A	N/A	N/A	40.9	(31.8-50.6)	1.7	(1.1-2.6)*	38.5	(31.0-46.6)	1.6	(1.1-2.4)*	N/A	N/A	N/A	N/A	27.1	(20.1-35.6)	1.2	(0.7-2.1)	15.8	(8.8-26.9)	1.2	(0.5-2.7)
Use of hookah																								
No P30D use	N/A	N/A	N/A	N/A	23.0	(20.5-25.7)	--	--	21.9	(19.8-24.1)	--	--	24.3	(21.1-27.8)	--	--	N/A	N/A	N/A	N/A	15.5	(12.4-19.2)	--	--
P30D use	N/A	N/A	N/A	N/A	43.8	(31.2-57.1)	2.0	(1.1-3.8)*	35.8	(27.4-45.1)	1.7	(1.1-2.8)*	28.9	(19.3-40.9)	1.1	(0.6-2.1)	N/A	N/A	N/A	N/A	#	#	#	#
Use of smokeless																								
No P30D use	N/A	N/A	N/A	N/A	23.5	(21.0-26.3)	--	--	21.6	(19.5-23.8)	--	--	24.2	(21.1-27.5)	--	--	17.9	(15.7-20.3)	--	--	N/A	N/A	N/A	N/A
P30D use	N/A	N/A	N/A	N/A	31.5	(22.3-42.6)	1.2	(0.7-1.9)	43.6	(33.4-54.3)	2.0	(1.2-3.2)**	29.3	(20.7-39.8)	0.9	(0.5-1.5)	27.1	(16.7-40.7)	1.3	(0.7-2.6)	N/A	N/A	N/A	N/A

Notes:
Abbreviations: P30D = past 30-day; ENDS = electronic nicotine delivery system; aOR = adjusted odds ratio; CI = confidence interval; N/A = not applicable; NR = Not Reported-- variables in which at least one level had a numerator N < 3 were not reported

The percentages and odds ratios in the table are based on weighted data.
Denominator N (unweighted number of observations) for aOR in "Any tobacco" = 2,774 without sexual orientation², 2,373 with sexual orientation
Denominator N (unweighted number of observations) for aOR in "Cigarettes" = 1,675 without sexual orientation², 1,442 with sexual orientation
Denominator N (unweighted number of observations) for aOR in "ENDS" = 2,164 without sexual orientation², 1,898 with sexual orientation
Denominator N (unweighted number of observations) for aOR in "Cigars" = 910 without sexual orientation², 851 with sexual orientation
Denominator N (unweighted number of observations) for aOR in "Hookah" = 1,065 without sexual orientation², 1,009 with sexual orientation
Denominator N (unweighted number of observations) for aOR in "Smokeless" = 630 without sexual orientation², 548 with sexual orientation

Tobacco product types were categorized into five groups: cigarettes, ENDS (e-cigarettes at Wave 1, and e-cigarettes, e-cigars, e-pipes, and e-hookah at Waves 2 & 3), cigars (traditional cigars, cigarillos, filtered cigars), hookah, and smokeless tobacco (loose snus, moist snuff, dip, spit, chewing tobacco, and snus pouches).

For each of the five tobacco products, and for any tobacco product, use is defined with respect to the given tobacco product/any tobacco product:

Previous use is defined as ever use, with no P30D use (or ever using the product, even 1 or 2 times, but not in the past 30 days);
P30D use is defined as using the product at least once in the past 30 days.

The outcome 'reuptake' is defined as P30D use at follow-up (vs. no P30D use at follow-up) among previous users at baseline.

Since no P30D use at baseline is defined with respect to each tobacco product, P30D of 'other' tobacco products at baseline are considered as correlates of 'reuptake' of the given tobacco product at follow-up.

GEE logistic regression analyses were used to assess correlates of 'reuptake' of P30D use at follow-up among previous users at baseline over a one-year period of time (i.e., Wave 1-Wave 2 and Wave 2-Wave 3), including up to two change data points per individual and statistically controlling for the correlation among observations from the same individuals.

All correlates reflect baseline measurement for each wave pair (e.g., when evaluating change between Wave 1 and Wave 2, the age correlate reflects a person's age at Wave 1, and when evaluating change between Wave 2 and Wave 3, the age correlate reflects a person's age at Wave 2).

Data consist of those who are youth at all three waves, youth who age into the adult cohort at Wave 3, shadow youth who age into the youth cohort at Wave 2, and Wave 1-Wave 2 data only from youth who age into the adult cohort at Wave 2.

¹Analyses adjusted for age group, sex, race/ethnicity, each tobacco use correlate, and wave. Sexual orientation (asked only of those 14 and older) was run separately and not included as a covariate in the other aORs.

Estimates with either a relative standard error greater than 30 or a corresponding denominator less than 50 have been suppressed.

* p < 0.05

** p < 0.01

*** p < 0.001

Supplemental Table 3: Correlates of 'Relapse' Among Recent Former Established Users (Adults 18+) with No P30D Tobacco Use at Baseline.

Correlates at baseline	Current (everyday/some day) use at follow-up																							
	Any Tobacco				Cigarettes				ENDS				Cigars				Hookah				Smokeless			
	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI	%	95% CI	aOR ¹	95% CI
Overall	32.9	(29.6-36.4)	N/A	N/A	27.9	(24.7-31.2)	N/A	N/A	21.5	(18.3-25.1)	N/A	N/A	20.0	(16.8-23.6)	N/A	N/A	15.3	(12.3-18.7)	N/A	N/A	23.6	(19.1-28.8)	N/A	N/A
DEMOGRAPHIC CHARACTERISTICS																								
Age group																								
18-24	38.4	(32.2-44.9)	--	--	36.8	(30.9-43.2)	--	--	21.1	(16.0-27.3)	--	--	18.1	(13.0-24.7)	--	--	NR	NR	NR	NR	26.0	(18.3-35.5)	--	--
25-39	34.1	(28.4-40.2)	0.9	(0.6-1.4)	25.2	(21.0-30.1)	0.7	(0.5-1.0)	25.4	(20.1-31.5)	1.5	(0.9-2.5)	19.0	(14.5-24.5)	0.9	(0.5-1.6)	NR	NR	NR	NR	27.0	(19.2-36.5)	.	.
40-54	31.1	(23.5-39.7)	0.7	(0.4-1.2)	28.9	(21.6-37.5)	0.8	(0.5-1.4)	17.7	(11.6-26.2)	1.1	(0.5-2.3)	26.7	(18.5-37.1)	1.5	(0.7-3.1)	NR	NR	NR	NR	23.6	(15.4-34.5)	.	.
55+	29.0	(21.0-38.5)	0.6	(0.3-1.0)	24.9	(18.3-33.1)	0.6	(0.3-1.1)	17.0	(9.8-28.0)	0.9	(0.4-2.3)	15.6	(9.1-25.6)	0.8	(0.3-2.0)	NR	NR	NR	NR	#	#	#	#
Sex																								
Female	32.2	(27.2-37.8)	--	--	30.3	(25.6-35.4)	--	--	21.8	(17.5-26.9)	--	--	13.2	(9.0-18.7)	--	--	15.2	(10.9-20.7)	--	--	#	#	#	#
Male	33.5	(28.6-38.7)	1.2	(0.8-1.8)	25.3	(21.5-29.5)	0.7	(0.5-1.0)	21.2	(16.5-26.8)	0.9	(0.6-1.5)	22.7	(18.2-28.0)	1.8	(0.9-3.8)	15.3	(11.7-19.8)	0.9	(0.5-1.5)	23.8	(18.9-29.5)	.	.
Race/ethnicity																								
Non-Hispanic White	32.4	(28.2-36.9)	--	--	27.9	(23.7-32.5)	--	--	21.2	(17.6-25.3)	--	--	19.0	(14.6-24.4)	--	--	13.4	(9.6-18.4)	--	--	NR	NR	NR	NR
Non-Hispanic Black	39.0	(29.5-49.4)	1.3	(0.8-2.1)	29.7	(20.1-41.4)	0.9	(0.5-1.7)	#	#	#	#	23.9	(14.3-37.0)	1.4	(0.6-3.4)	#	#	#	#	NR	NR	NR	NR
Non-Hispanic Other (includes two or more races)	26.1	(17.8-36.7)	0.7	(0.4-1.3)	#	#	#	#	#	#	#	#	18.4	(10.5-30.2)	1.1	(0.5-2.5)	#	#	#	#	NR	NR	NR	NR
Hispanic	33.4	(25.7-42.1)	0.9	(0.6-1.4)	29.9	(23.3-37.5)	1.0	(0.6-1.5)	31.6	(20.6-45.2)	1.8	(0.9-3.7)	19.7	(12.8-29.0)	1.2	(0.6-2.4)	19.9	(12.7-29.6)	1.3	(0.6-2.7)	NR	NR	NR	NR
Educational attainment																								
Less than high school or some high school (no diploma) or GED	38.3	(29.2-48.3)	--	--	34.7	(26.1-44.5)	--	--	21.2	(15.0-29.0)	--	--	15.1	(9.8-22.6)	--	--	15.3	(8.7-25.6)	--	--	16.9	(10.1-26.7)	--	--
High school graduate—diploma	36.4	(28.8-44.8)	0.9	(0.5-1.7)	29.2	(22.4-37.2)	0.8	(0.4-1.4)	23.2	(15.5-33.3)	1.3	(0.6-2.7)	24.9	(17.8-33.5)	1.7	(0.8-3.3)	22.2	(14.8-32.0)	1.7	(0.7-4.4)	30.7	(19.6-44.6)	.	.
Some college (no degree) or associate degree	30.5	(25.1-36.4)	0.7	(0.4-1.3)	25.0	(20.9-29.7)	0.7	(0.4-1.1)	20.6	(15.9-26.2)	1.0	(0.6-1.8)	19.5	(14.2-26.2)	1.5	(0.6-3.3)	16.5	(11.8-22.7)	1.1	(0.4-2.8)	21.3	(13.3-32.1)	.	.
Bachelor's degree or more	28.5	(22.9-34.8)	0.7	(0.4-1.3)	24.0	(17.8-31.5)	0.8	(0.4-1.5)	22.5	(13.4-35.3)	1.3	(0.5-3.4)	#	#	#	#	#	#	#	#	#	#	#	#
Annual household income																								
< \$25,000	36.5	(31.2-42.1)	--	--	35.7	(29.9-41.9)	--	--	18.6	(13.7-24.7)	--	--	19.8	(15.3-25.2)	--	--	15.2	(11.0-20.6)	--	--	22.4	(15.4-31.5)	--	--
\$25,000- \$74,999	32.4	(27.1-38.2)	0.9	(0.6-1.3)	24.3	(19.8-29.5)	0.6	(0.4-1.0)	25.2	(20.0-31.3)	1.5	(0.9-2.6)	21.0	(14.6-29.3)	1.0	(0.6-1.8)	15.2	(10.6-21.3)	1.0	(0.5-1.9)	15.8	(10.1-24.0)	.	.
≥ \$75,000	28.1	(20.3-37.5)	0.8	(0.4-1.4)	19.2	(13.2-27.0)	0.5	(0.3-0.8)*	18.2	(11.4-27.7)	1.0	(0.4-2.3)	20.7	(12.3-32.8)	1.0	(0.4-2.3)	#	#	#	#	38.0	(25.3-52.7)	.	.
Not reported	33.2	(21.1-48.0)	0.8	(0.4-1.8)	31.3	(20.1-45.1)	0.9	(0.4-1.8)	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
TOBACCO USE CORRELATES																								
Use of cigarettes																								
No P30D use	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.3	(11.7-24.7)	--	--	20.8	(15.1-28.1)	--	--	17.8	(13.4-23.3)	--	--	27.7	(19.9-37.3)	--	--
P30D use	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.9	(19.1-27.3)	1.5	(0.8-2.7)	19.4	(15.7-23.7)	1.0	(0.5-1.7)	13.0	(9.2-18.0)	0.6	(0.4-1.1)	20.0	(15.0-26.2)	.	.
Use ENDS																								
No P30D use	N/A	N/A	N/A	N/A	27.8	(24.2-31.7)	--	--	N/A	N/A	N/A	N/A	19.3	(15.6-23.6)	--	--	16.3	(12.7-20.7)	--	--	24.1	(17.9-31.5)	--	--
P30D use	N/A	N/A	N/A	N/A	27.7	(22.3-33.7)	1.1	(0.7-1.6)	N/A	N/A	N/A	N/A	22.9	(15.5-32.5)	1.2	(0.6-2.3)	14.0	(8.5-22.1)	0.7	(0.3-1.5)	22.1	(14.8-31.7)	.	.
Use of cigars																								
No P30D use	N/A	N/A	N/A	N/A	27.4	(24.1-31.0)	--	--	20.9	(17.5-24.7)	--	--	N/A	N/A	NA	N/A	15.7	(12.3-19.8)	--	--	22.7	(17.2-29.4)	--	--
P30D use	N/A	N/A	N/A	N/A	37.0	(27.6-47.5)	1.6	(0.9-2.9)	24.7	(17.2-34.1)	1.1	(0.6-2.2)	N/A	N/A	NA	N/A	14.2	(9.2-21.3)	0.8	(0.4-1.7)	27.2	(18.1-38.7)	.	.
Use of hookah																								
No P30D use	N/A	N/A	N/A	N/A	27.5	(24.3-31.0)	--	--	20.8	(17.4-24.6)	--	--	20.3	(16.9-24.1)	--	--	N/A	N/A	N/A	N/A	23.9	(19.2-29.3)	--	--
P30D use	N/A	N/A	N/A	N/A	38.6	(27.7-50.9)	1.4	(0.8-2.4)	31.6	(19.8-46.5)	1.7	(0.7-3.8)	16.7	(9.4-27.9)	0.9	(0.4-2.2)	N/A	N/A	N/A	N/A	#	#	#	#
Use of smokeless																								
No P30D use	N/A	N/A	N/A	N/A	27.1	(24.0-30.5)	--	--	20.8	(17.6-24.4)	--	--	19.3	(15.9-23.2)	--	--	14.9	(11.8-18.6)	--	--	N/A	N/A	N/A	N/A
P30D use	N/A	N/A	N/A	N/A	36.9	(25.7-49.7)	1.9	(1.0-3.8)	#	#	#	#	25.5	(15.8-38.4)	1.4	(0.6-3.5)	#	#	#	#	N/A	N/A	N/A	N/A
Mean tobacco dependence score²	10.5	(9.1-11.9)	1.2	(1.1-1.4)**	14.5	(13.0-15.9)	1.1	(1.0-1.3)	44.4	(41.5-47.3)	1.2	(1.0-1.5)	33.0	(30.2-35.9)	1.2	(0.9-1.5)	23.3	(20.6-26.1)	0.8	(0.6-1.0)	37.1	(33.3-40.9)	.	.

Notes:
Abbreviations: P30D = past 30-day; ENDS = electronic nicotine delivery system; aOR = adjusted odds ratio; CI = confidence interval; N/A = not applicable; NR = Not Reported-- variables in which at least one level had a numerator N < 3 were not reported

The percentages and odds ratios in the table are based on weighted data.
Denominator N (unweighted number of observations) for aOR in "Any tobacco" = 1,133 without tobacco dependence, 1,069 with tobacco dependence
Denominator N (unweighted number of observations) for aOR in "Cigarettes" = 1,181 without tobacco dependence, 1,197 with tobacco dependence
Denominator N (unweighted number of observations) for aOR in "ENDS" = 599 without tobacco dependence, 593 with tobacco dependence
Denominator N (unweighted number of observations) for aOR in "Cigars" = 657 without tobacco dependence, 667 with tobacco dependence
Denominator N (unweighted number of observations) for aOR in "Hookah" = 494 without tobacco dependence, 480 with tobacco dependence
Denominator N (unweighted number of observations) for aOR in "Smokeless" = 348 without tobacco dependence, 337 with tobacco dependence

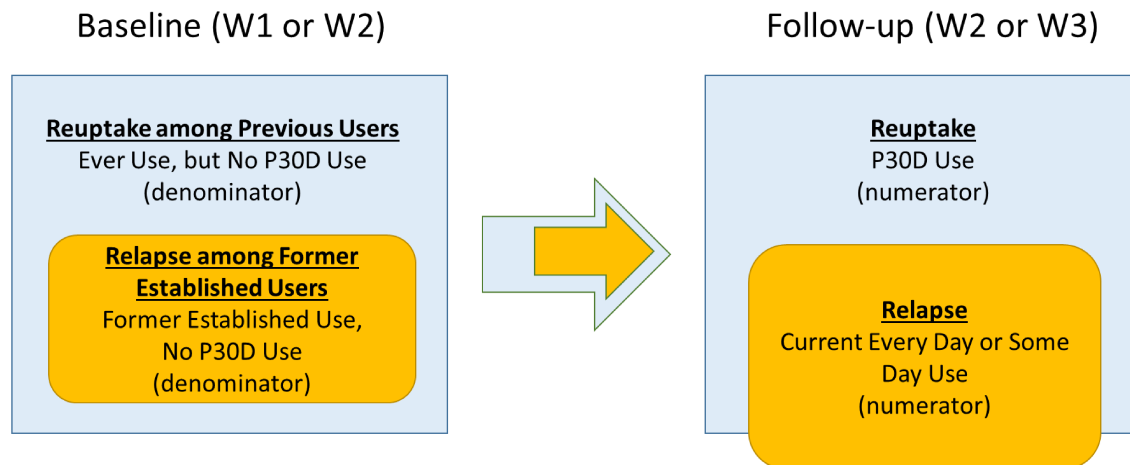
Tobacco product types were categorized into five groups: cigarettes, ENDS (e-cigarettes at Wave 1, and e-cigarettes, e-cigars, e-pipes, and e-hookah at Waves 2 & 3), cigars (traditional cigars, cigarillos, filtered cigars), hookah, and smokeless tobacco (loose snus, moist snuff, dip, spit, chewing tobacco, and snus pouches).

For each of the five tobacco products, and for any tobacco product, use is defined with respect to the given tobacco product/any tobacco product:
Recent former established use is defined as having used a product within the past 12 months, used it fairly regularly (or smoked more than 100 cigarettes in their lifetime), and currently does not use tobacco at all and has not used the product in the past 30 days;
Current (everyday/some day) use is defined as using everyday or some days;
P30D use is defined as use on at least one of the past 30 days.

The outcome 'relapse' is defined as current (everyday/some day) use at follow-up (vs. no use at all) among recent former established users at baseline.
Since no P30D use at baseline is defined with respect to each tobacco product, P30D use of 'other' tobacco products at baseline are considered as correlates of 'relapse' of the given tobacco product at follow-up.

GEE logistic regression analyses were used to assess correlates of 'relapse' at follow-up among recent former established users at baseline over a one-year period of time (i.e., Wave 1-Wave 2 and Wave 2-Wave 3), including up to two change data points per individual and statistically controlling for the correlation among observations from the same individuals.
All correlates reflect baseline measurement for each wave pair (e.g., when evaluating change between Wave 1 and Wave 2, the age correlate reflects a person's age at Wave 1, and when evaluating change between Wave 2 and Wave 3, the age correlate reflects a person's age at W2).
¹Analyses adjusted for age group, sex, race/ethnicity, sexual orientation (not reported due to low sample size across products; e.g. N range =1-7), educational attainment, annual household income, each tobacco use correlate, and wave.
²Tobacco dependence score was defined as described and validated by Strong et al. (2017). Tobacco dependence questions may have been asked about their recent former product use (i.e., questions asked about smokeless tobacco in particular) or about tobacco use generally if they were current or recent former user of another tobacco product. Weighted means are presented with 95% confidence intervals. Odds ratios and 95% confidence intervals are scaled to a mean of 0 with standard deviation of 1 for each tobacco product (therefore, ORs indicate the likelihood of the outcome per standard deviation unit increase in the level of tobacco dependence for each tobacco product). AORs of tobacco dependence were based on adjusted models including only demographic variables. Other adjusted models did not include this measure.
Estimates with either a relative standard error greater than 30 or a corresponding denominator less than 50 have been suppressed.
* p <0.05
** p <0.01
*** p <0.001
"." Indicates the adjusted GEE model was not able to converge, likely due to small cell sizes.

Supplemental Figure 1: Illustration of Definition for Reuptake Versus Relapse in Adults Over a One-Year Period.



Notes:

Abbreviations: W1= Wave 1; W2= Wave 2; W3= Wave 3; P30D= Past 30-Day, or using the product at least once in the past 30 days

The outcome for "relapse" is current every day or some day use, which may include those who have indicated they currently use "some days" but have not used the product in the past 30 days. Therefore, the yellow box is not completely situated in the blue box.

Ever use includes ever using the product, even once or twice.

Former established use is defined as having used a product fairly regularly (or smoked more than 100 cigarettes in their lifetime), and currently does not use tobacco at all and has not used the product in the past 30 days.

Supplemental Material.

```

/*****
* PATH_GEE_MACRO_CORRELATESPAPERS_12072018.SAS
*
* THIS SAS MACRO WAS CREATED FOR PATH CORRELATES PAPERS, TO
* 1. RUN GENERALIZED ESTIMATING EQUATIONS (GEE) MODELS WITH BINARY RESPONSE/OUTCOME VARIABLES AND
* PREDICTORS, USING FULL-SAMPLE AND REPLICATE WEIGHTS (100 HERE).
* (AUTHOR NOTES: THIS IS A QCED TEMPLATE; THIS MACRO CAN BE MODIFIED TO RUN FOR OTHER TYPES OF
* RESPONSE VARIABLES BY SPECIFYING APPROPRIATE DISTRIBUTION AND LINK FUNCTION)
* 2. COMPUTE VARIANCES USING THE BALANCED REPEATED REPLICATION (BRR) METHOD WITH FAY'S ADJUSTMENT (0.3).
* 3. COMPUTE TEST STATISTICS, P VALUES, AND 95% CONFIDENCE LIMITS.
* 4. OUTPUT GEE ODDS RATIO POINT ESTIMATES, 95% CONFIDENCE LIMITS, AND P VALUES, LABELLED WITH RESPONSE
* AND PREDICTOR VARIABLE NAMES AND EFFECT LEVELS (IF CATEGORICAL PREDICTORS).
*
* WHO: CO-AUTHOR OF PATH CORRELATES PAPERS
* WHEN: 1/23/2018
* 12/7/2018: CO-AUTHOR MODIFIED COMMENTS AND FORMATS FOR JOURNAL SUBMISSION
*****/

```

```
*LIBNAME IN '-\PATH\CORRELATES_PAPERS\ANALYSIS\DATA';
```

```
TITLE 'PROJECT PATH: MULTI-WAVE DERIVED DATASETS (FINAL DRAFT)';
```

```
OPTIONS NOCENTER NOFMterr LS=155 PS=87;
```

```
%MACRO MAC_GEE0(VAR=, COV=);
```

```
%LET WHERE= EVR_&VAR = 0 AND EVR_&VAR._FUP IN (0,1) AND WAVE IN (1,2) AND
    COVVAR >= 0
;
```

```
*NON-MISSING OUTCOME AND THE COVARIATES;
```

```
DATA D2; SET D0; WHERE &WHERE; RUN;
```

```
TITLE2 "GENMOD (GEE) MACRO: MODELING NEW EVER USE OF &VAR AMONG NEVER USERS";
```

```
TITLE3 "GENMOD (GEE) MODELING: MAIN-EFFECT OF WAVE AND &COV (FULL-SAMPLE WEIGHTED)";
```

```
PROC GENMOD DATA=D2;
```

```
CLASS PID WAVE (REF='1')
```

```
/PARAM=REF;
```

```
MODEL EVR_&VAR._FUP (EVENT='1') = WAVE &COV/DIST = BIN LINK = LOGIT;
```

```
REPEATED SUBJECT = PID/ TYPE = UN COVB CORRW;
ODS OUTPUT GEEEMPPEST=_EST ;
WEIGHT WGT;
RUN;
DATA EST0; SET _EST;
LENGTH OUTCOME $20;
OUTCOME="&VAR";
WHERE PARM^="INTERCEPT";
OBS=_N_;
RUN;
PROC SORT DATA=EST0;
  BY OBS;
RUN;
DATA EST; SET EST0;
  VAR=0;
RUN;
%MEND;

%MACRO MAC_GEE1(VAR=, COV=, N=);
%DO I=1 %TO &N;
TITLE3 "GENMOD (GEE) MODELING: MAIN-EFFECT OF WAVE AND &COV (REPLICATE WEIGHT # &I)";
PROC GENMOD DATA=D2;
  CLASS PID WAVE (REF='1')
  /PARAM=REF;
  MODEL EVR_&VAR._FUP (EVENT='1') = WAVE &COV/DIST = BIN LINK = LOGIT;
  REPEATED SUBJECT = PID/ TYPE = UN COVB CORRW;
  ODS OUTPUT GEEEMPPEST=_EST_&I;
  WEIGHT WGT&I;
RUN;
DATA EST_&I; SET _EST_&I;
  LENGTH OUTCOME $20;
  OUTCOME="&VAR";
  WHERE PARM^="INTERCEPT";
  OBS=_N_;
  RENAME ESTIMATE=EST_&I;
RUN;
PROC SORT DATA=EST_&I;
  BY OBS;
RUN;
DATA EST; MERGE EST EST_&I(KEEP=OBS EST_&I); BY OBS;
  VAR_&I=(EST_&I-ESTIMATE)**2;
  VAR=VAR+VAR_&I;
RUN;
%END;
```

```
%MEND;
```

```
%MAC_GEE0(VAR=OUTCOMEVAR, COV=COVVAR);
```

```
%MAC_GEE1(VAR=OUTCOMEVAR, COV=COVVAR, N=100);
```

```
DATA EST1; SET EST;
```

```
SE_BRR=SQRT(VAR*0.01); *1/100;
```

```
SE_BRRFAY=SQRT(VAR*0.020408); *1/(100*(1-0.3)^2);
```

```
TVALUE_BRR=ESTIMATE/SE_BRR;
```

```
TVALUE_BRRFAY=ESTIMATE/SE_BRRFAY;
```

```
PVALUE_BRR=(1-PROBT(ABS(TVALUE_BRR),100))*2;
```

```
PVALUE_BRRFAY=(1-PROBT(ABS(TVALUE_BRRFAY),100))*2;
```

```
PVALUE_QC1984=(1-PROBT(ABS(1.984),100))*2;
```

```
RENAME
```

```
  Z=WGT0_ZVALUE
```

```
  PROBZ=WGT0_PVALUE
```

```
  PARM=VARIABLE
```

```
  LEVEL1=EFFECT;
```

```
RUN;
```

```
DATA EST2; SET EST1;
```

```
ODDSRATIOEST=EXP(ESTIMATE);
```

```
LOWERCL=EXP(ESTIMATE-1.984*SE_BRRFAY);
```

```
UPPERCL=EXP(ESTIMATE+1.984*SE_BRRFAY);
```

```
  RENAME PVALUE_BRRFAY=PVALUE;
```

```
RUN;
```

```
TITLE2 'GEE (ADJUSTED): MODELING INITIATION- NEW NEW EVER USE AMONG NEVER USERS';
```

```
TITLE3 "GENMOD (GEE) MACRO PRODUCED BRR SES AND TEST STATS (WITH FAY ADJUSTMENT), OUTPUT GENERATED ON &JOBDATE";
```

```
PROC PRINT DATA=EST2;
```

```
  VAR OUTCOME VARIABLE EFFECT OD: LOWER: UPPER: PVALUE;
```

```
RUN;
```