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- No other financial relationships to disclose.
- No industry funding; no off-label medications use discussed
- The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health, the Food and Drug Administration, or HRSA.

http://www.med.uvm.edu/behaviorandhealth/home



Areas of focus

Young adult substance use and cessation

COBRE Project – Socioeconomicallydisadvantaged smokers

Menthol/flavors

Emerging tobacco products

PATH

UVM TCORS

Nicotine perceptions

Tobacco regulatory science

Methods and measures

Quantitative policy analysis

Survey measures, design, and analysis

UVM Center on Rural Addiction

Origin of the PACE Vermont Study...





Our goal is to understand the impact of state-level policies and communication campaigns on substance use beliefs and behaviors in young Vermonters.

Study team

UVM

- Vermont Center on Behavior and Health
 - Andrea Villanti, PhD, MPH
 - Julia West
 - Kate Peasley-Miklus, PhD
 - Elias Klemperer, PhD
 - Sara Lepine
 - Caitlin McCluskey

Co-Investigators

- UVM
 - Valerie Harder, PhD
 - Alexandra Potter, PhD
 - Jeff Priest, PhD
- JHSPH
 - Meghan Moran, PhD

Health Department

- ADAP
 - Megan Trutor
 - Chelsea Carman
- Commissioner's Office
 - Shayla Livingston
- Communication
 - Nancy Erickson
 - Kathleen Horton
- HPDP
 - Christie Vallencourt
 - Rhonda Williams
- Health Surveillance
 - Jen Hicks
 - Maria Roemhildt
 - Amanda Jones
 - Jeffrey Trites

UVM/Health Partnership









What PACE offers

Rapid and flexible

 Add or remove questions to align with new policies or communication activities

Complement existing data

- National and statewide surveys
- Sub-studies or randomized experiments within the cohort on topics of interest

Peer crowds segmentation

Developing and evaluating marketing campaigns

Inform and support

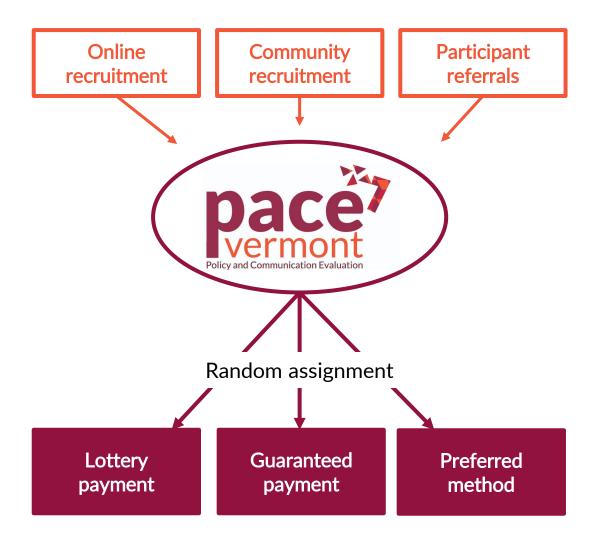
- Substance use policies and campaigns
- Shared access to data
- Protocol for developing reports and other scientific products

Pilot study aims

Aim 1: Data

Substance-related beliefs, behaviors, policies, and health messages over time in a cohort of Vermont youth and young adults.

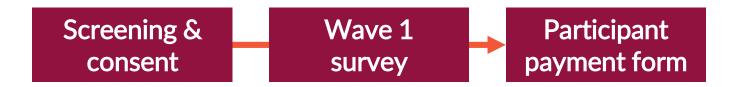
Aim 2: Recruitment



Aim 3: Retention

Study flow, by age group

Young adults, aged 18-25



Youth, aged 12-17



Timeline for pilot data collection

Weeks 1-10: Wave 1

(3/26/19 - 6/5/19)

Weeks 26-29:

Wave 3

(9/17/19 - 10/15/19)

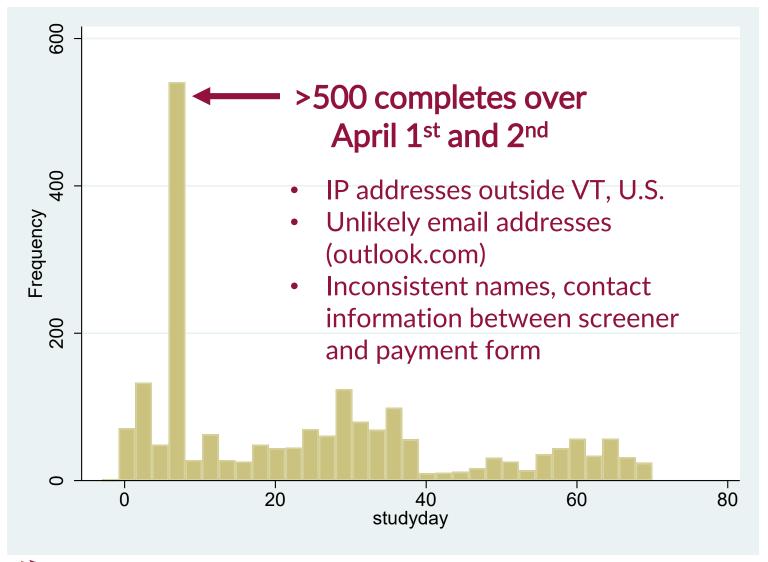


Weeks 14-19:

Wave 2

(6/27/19 - 7/31/19)

Completion of Wave 1 surveys, by day

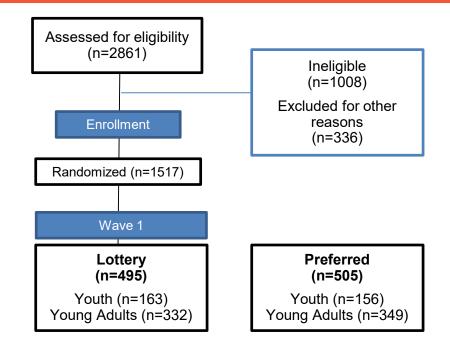




Ensuring valid responses

- Added automatic screening by location within our survey platform (Qualtrics);
- 2. Conducted consistency checks between age and date of birth, as well as state of residence and location of IP address;
- 3. Added a CAPTCHA item in the screener to ensure that respondents were human, not bots;
- Conducted additional manual screening of study e-mail addresses and phone numbers; and
- 5. Compared information from the screening and payment forms to verify eligibility.

Enrollment flow



Guaranteed (n=517)

Youth (n=161) Young Adults (n=356)

Recruitment effectiveness

	Cost	Total Survey Starts	Cost per Conversion
Facebook & Instagram	\$23,676	2,013	\$12
Google Display & Gmail	\$9,214	749	\$12
Front Porch Forum(Paid Post, Partial State Coverage)	\$4,950	117	\$42
Front Porch Forum(Two Paid Posts, Statewide)	\$0	822	\$0
Newspaper Print Ads	\$2,605	1	\$2,605
Craigslist	\$0	5	\$0
Partner Sources	\$0	42	\$0
Total	\$40,445	3,749	

Recruitment cost per eligible enrolled participant: \$27

Which incentive performed best?

- Which of the following would you like to receive for completing other online surveys like this?
 - Receive a \$10 online gift card
 - Be entered into a lottery to receive \$50

Guaranteed (n=517)

Youth (n=161) Young Adults (n=356)

Wave 1

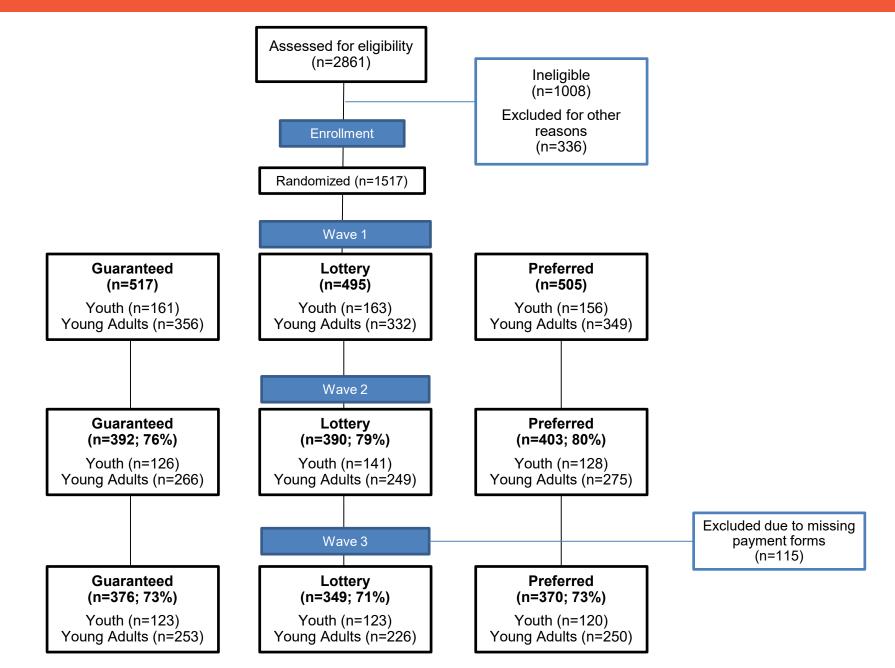
Lottery (n=495)

Youth (n=163) Young Adults (n=332)

Preferred (n=505)

Youth (n=156) Young Adults (n=349)

Enrollment flow



Sample characteristics

	to st
	n (%)
Age group	
12-17	480 (31.6)
18-25	1037 (68.4)
County of residence	
Addison	114 (7.5)
Bennington	54 (3.6)
Caledonia	60 (4.0)
Chittenden	656 (43.2)
Essex	14 (0.9)
Franklin	83 (5.5)
Grand Isle	15 (1.0)
Lamoille	54 (3.6)
Not sure	31 (2.0)
Orange	46 (3.0)
Orleans	29 (1.9)
Rutland	83 (5.5)
Washington	181 (11.9)
Windham	54 (3.6)
Windsor	42 (2.8)
**Missing	1 (0.1)
Sex	
Female	1071 (70.6)
Male	444 (29.3)
**Missing	2 (0.1)



Distribution by age and county, weighted

	12-17		18-25		Total	
	n (%)	VT %	n (%)	VT %	n (%)	VT %
Please select your co	unty of residence	ce				
Addison	39 (6.0)	5.6	75 (7.0)	7.3	114 (7.0)	6.7
Bennington	15 (4.0)	5.9	39 (5.0)	5.0	54 (5.0)	5.3
Caledonia	13 (5.0)	5.3	47 (5.0)	4.2	60 (5.0)	4.6
Chittenden	163 (28.0)	24.5	493 (42.0)	38.7	656 (37.0)	33.6
Essex	6 (1.0)	1.0	8 (0)	0.6	14 (0)	0.7
Franklin	34 (8.0)	9.1	49 (6.0)	5.9	83 (7.0)	7.0
Grand Isle	9 (1.0)	1.1	6 (0)	0.7	15 (0)	0.9
Lamoille	30 (4.0)	4.2	24 (3.0)	3.6	54 (3.0)	3.8
Not sure	15 (3.0)	-	16 (2.0)	-	31 (3.0)	-
Orange	15 (4.0)	4.7	31 (2.0)	3.6	46 (3.0)	4.0
Orleans	3 (1.0)	4.5	26 (2.0)	3.1	29 (2.0)	3.6
Rutland	29 (9.0)	9.1	54 (9.0)	8.2	83 (9.0)	8.6
Washington	81 (11.0)	9.6	100 (9.0)	5.2	181 (10.0)	8.7
Windham	13 (5.0)	6.6	41 (4.0)	5.2	54 (5.0)	5.7
Windsor	14 (8.0)	8.7	28 (4.0)	5.7	42 (6.0)	6.8
Total	479 (100.0)		1037 (100.0)		1516 (100.0)	

Sociodemographics, weighted

	Age g	Age group			
	12-17	18-25	Total		
Gender					
Male	167 (44.0)	237 (45.0)	404 (44.0)		
Female	266 (46.0)	716 (48.0)	982 (47.0)		
Transgender	34 (7.0)	73 (6.0)	107 (7.0)		
Don't know	11 (3.0)	7 (1.0)	18 (1.0)		
Don't understand Q	1 (0)	4 (1.0)	5 (1.0)		
Race/ethnicity, 5 categories					
White	426 (88.0)	892 (84.0)	1318 (86.0)		
Asian	10 (2.0)	26 (2.0)	36 (2.0)		
Black or African American	5 (1.0)	17 (2.0)	22 (2.0)		
Other/multiple race	19 (4.0)	47 (5.0)	66 (5.0)		
Hispanic	19 (4.0)	55 (6.0)	74 (6.0)		
Sexual orientation					
Another sexual orientation	17 (4.0)	21 (2 .0)	38 (3 .0)		
Bisexual	37 (8.0)	149 (1 2 .0)	186 (1 0 .0)		
Gay	4 (1.0)	26 (4.0)	30 (3.0)		
Lesbian	9 (2.0)	21 (1.0)	30 (2.0)		
Queer	8 (1.0)	43 (4.0)	51 (3.0)		
Questioning/Not sure	41 (7.0)	34 (3.0)	75 (4.0)		
Straight/Heterosexual	363 (7 7 .0)	743 (73.0)	1106 (75.0)		

	\	Youth (ages 12-17)		Young	Young adults (ages 1		
		Weighted	NSDUH		Weighted	NSDUH	
	n	%	estimate	n	%	estimate	
Cigarette use							
Ever	42	9.1%	9.6% ^a	487	47.4%	45.9% ^a	
Past 30-day	11	2.2%	5.8% ^b	178	18.8%	33.4% ^b	
Alcohol use							
Ever	141	29.4%	26.3% ^a	935	89.5%	79.7% ^a	
Past 30-day	43	9.3%	13.6% ^b	743	70.8%	70.9% ^b	
Binge alcohol use, past							
30-day	13	3.1%	7.2% ^b	484	48.3%	49.3% ^b	
Marijuana use							
Ever	80	16.3%	15.4% ^a	742	70.6%	51.3% ^a	
Past 30-day	47	8.7%	10.8% ^b	412	41.3%	38.8% ^b	

^a NSDUH 2018 National estimates

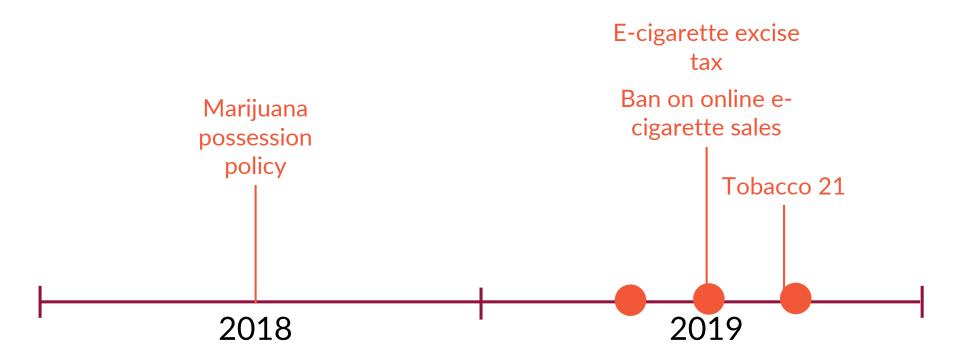
^b NSDUH 2016-2017 State-level estimates



Rapid Response: Examples from PACE Vermont

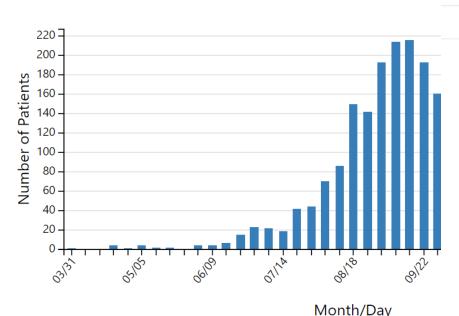
Unique items in PACE Vermont

- Peer crowds
- Policy awareness and support
- Awareness of communication efforts



Other secular events

Number of hospitalized EVALI patients by date of admission — United States, March 31, 2019–January 11, 2020



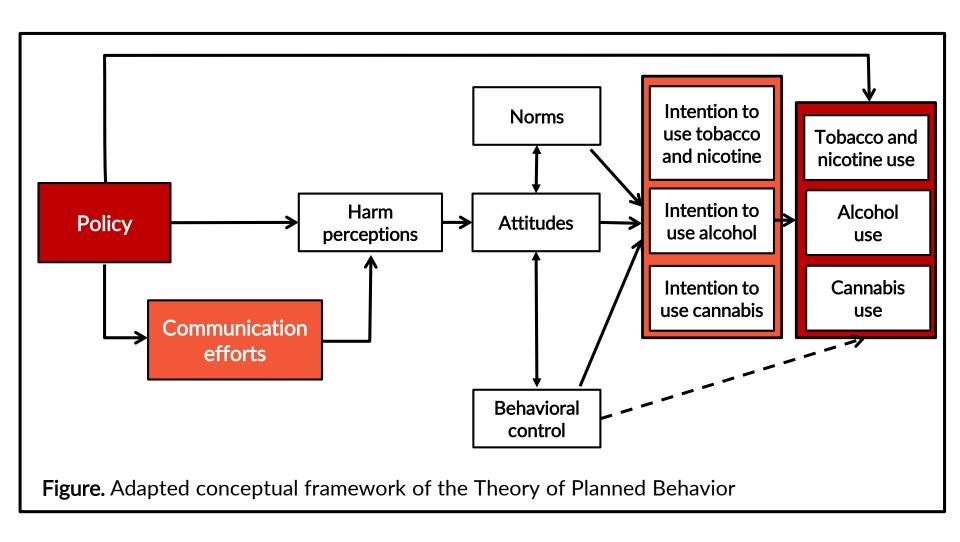
Numbers do not sum to 2,668 due to missing admission dates.

The New Hork Times

Trump Administration Plans to Ban Flavored E-Cigarettes

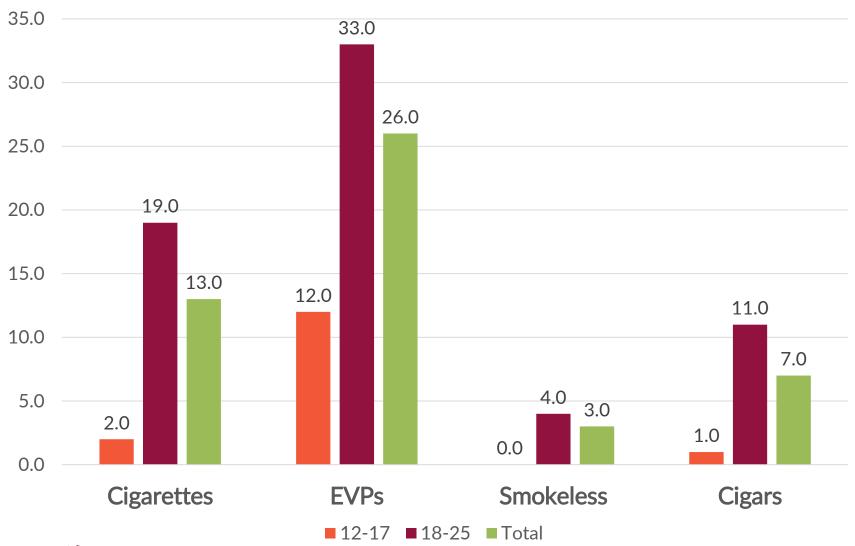
As vaping-related illnesses spread, President Trump and top health officials met at the White House to discuss ways to keep the products away from teenagers.





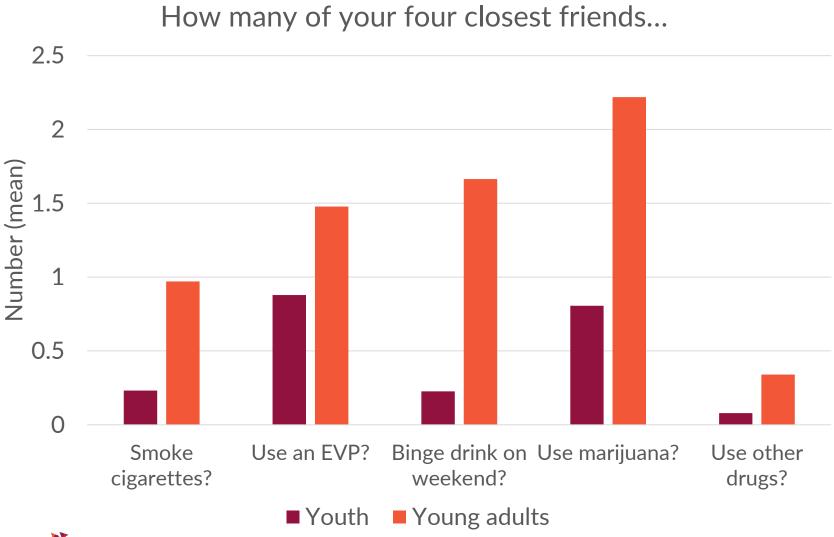
Rapid Response Example 1: Electronic vapor product & marijuana use (EVALI)

Past 30-day tobacco use, by age, weighted





Social influences on substance use (weighted)



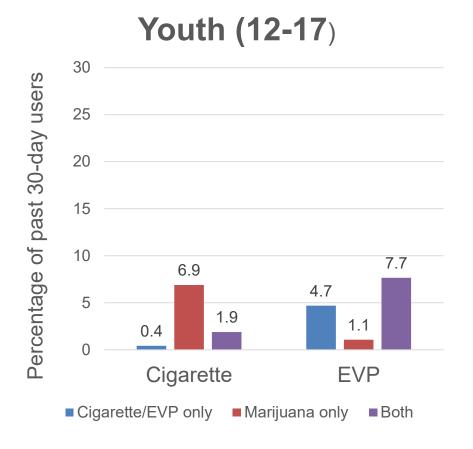


Last time you vaped... (weighted)

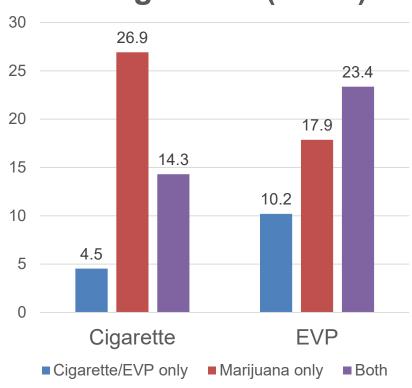
Last time you vaped, what was in the mist	Age §		
you inhaled?	12-17	18-25	Total
Nicotine	68 (55.4)	330 (55.3)	398 (55.4)
Marijuana or hash oil	20 (18.8)	172 (28.9)	192 (27.2)
Just flavoring	12 (17.7)	61 (10.9)	73 (12.1)
OH CDD 'I	4 (0.4)	44 (4.0)	40 (0.0)
Other - CBD oil	1 (0.4)	11 (1.0)	12 (0.9)
Other - Essential oil	1 (0.5)	0 (0.0)	1 (0.1)
	4 (0.0)	0 (0 7)	0 (0 7)
Other - N/A	1 (0.8)	2 (0.7)	3 (0.7)
I don't know	8 (6.2)	24 (3.1)	32 (3.6)
Total	111	600	711



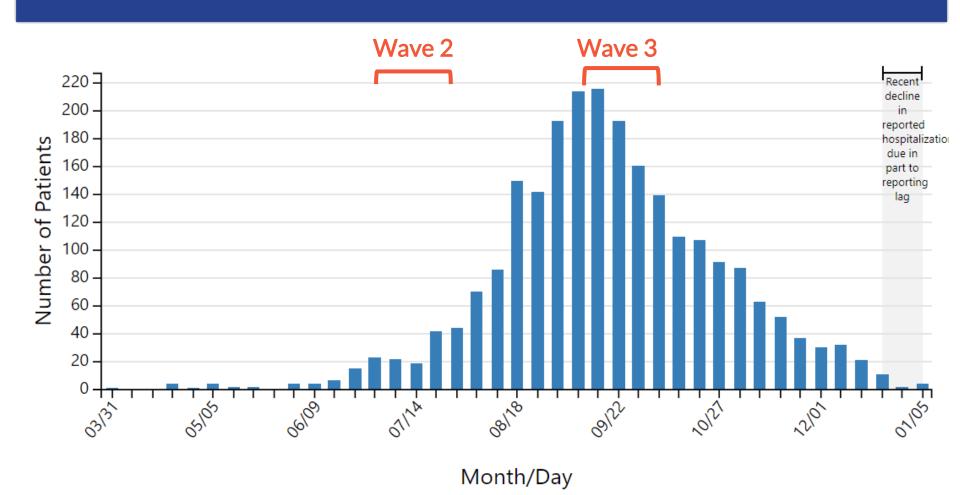
Past 30-day cigarette, electronic vapor product (EVP), and marijuana use, Vermont 2019 (weighted)







Number of hospitalized EVALI patients by date of admission — United States, March 31, 2019–January 11, 2020

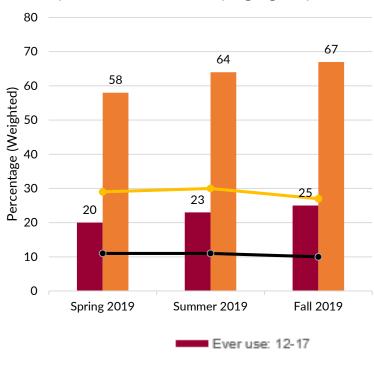


Numbers do not sum to 2,668 due to missing admission dates.

EVP and marijuana use

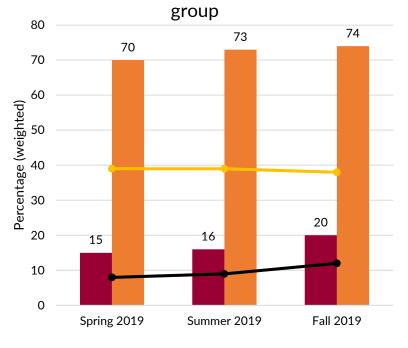
Ever and past 30-day electronic vapor product (EVP) and marijuana use by age group, PACE Vermont pilot study, 2019

1a. Prevalence of electronic vapor product (EVP) use by age group



Past 30-day use: 12-17

1b. Prevalence of Marijuana use by age



Ever use: 18-25

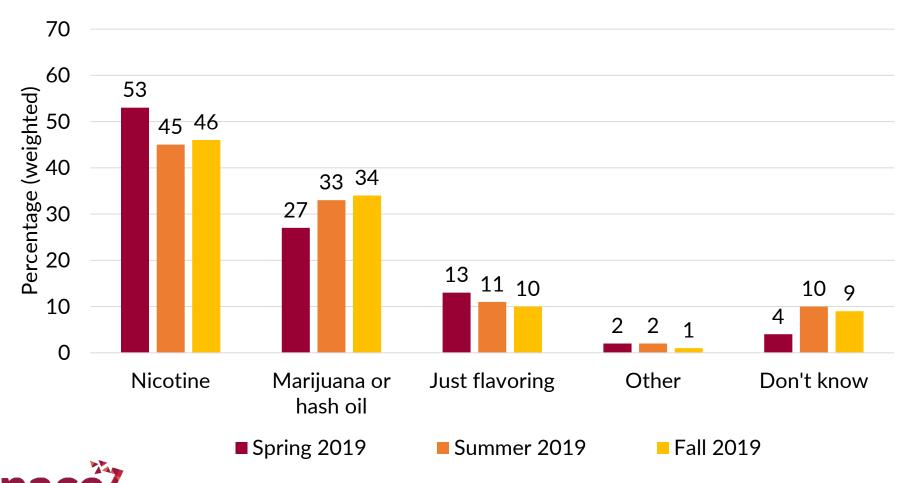
Past 30-day use: 18-25



Waves 1-3, complete cases

Last time you vaped... (weighted)

Last time you vaped, what was in the mist you inhaled?



Quit or cut down in past year? (weighted)

- Among past 30-day users:
 - 61% of EVP users tried to quit or cut down
 - 25% of marijuana users tried to quit or cut down

Top three reasons for quitting/cutting down on EVPs:

Top three reasons for quitting/cutting down on marijuana:

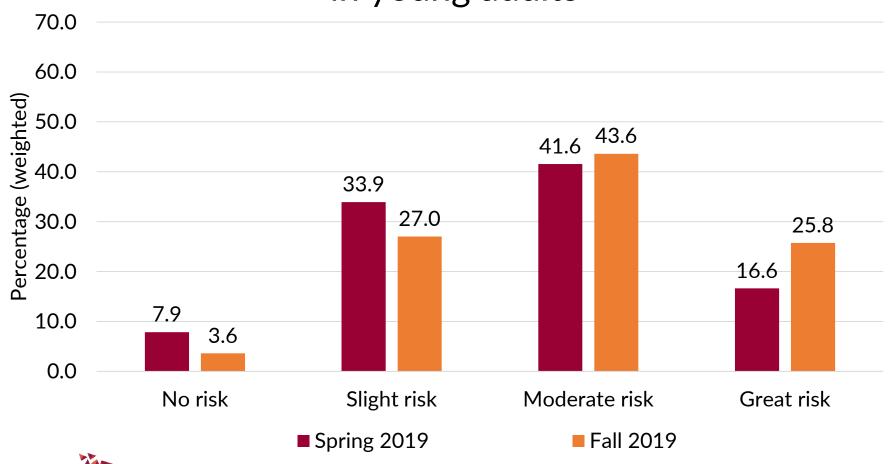
- 1. Health (81%)
- 2. Money/cost (61%)
- 3. Freedom from addiction (41%)

- 1. Other (34%)
- 2. Money/cost (26%)
- 3. Health (25%)



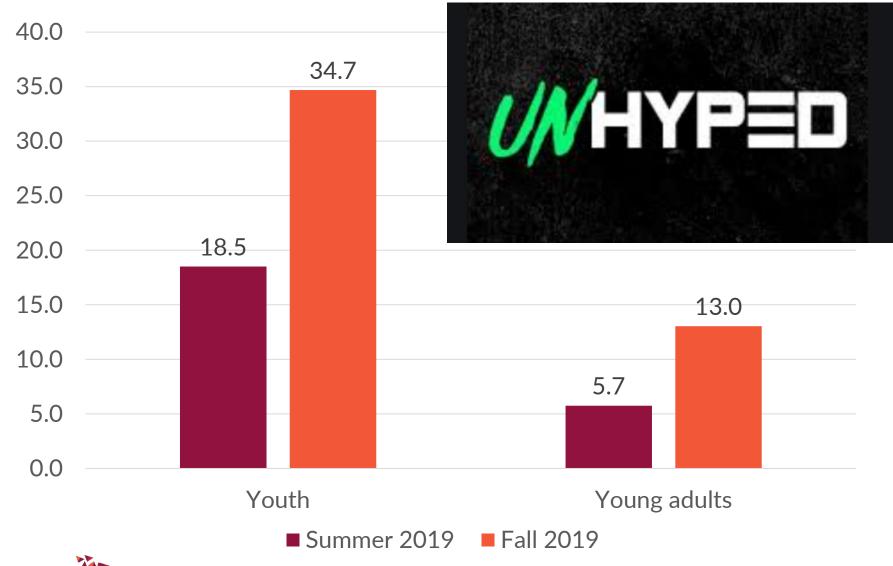
Perceived risk of EVP use... (weighted)

Perceived risk of weekly EVP use in young adults





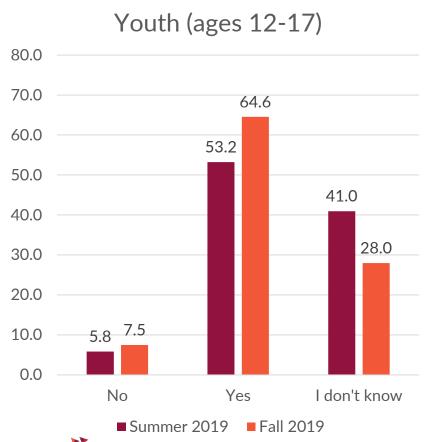
Awareness of UNHYPED (weighted)

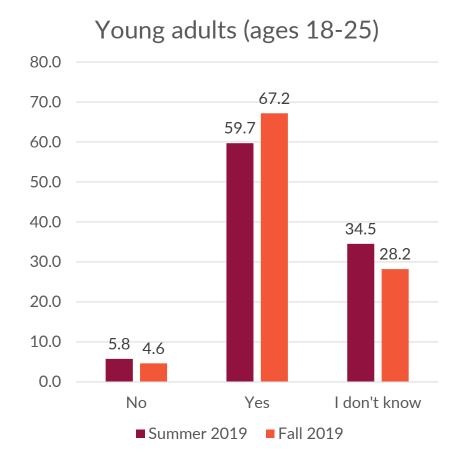




EVP beliefs (weighted)

One 5% vape pod can contain as much nicotine as an entire pack of cigarettes.







Future directions

- NIH grant submitted Nov 2019 (R21)
 - "Perceptions and Problems Associated with Vaping in Youth and Young Adults"
 - Two year grant
 - Collect three *new* waves of data in the PACE Vermont Study in 2020

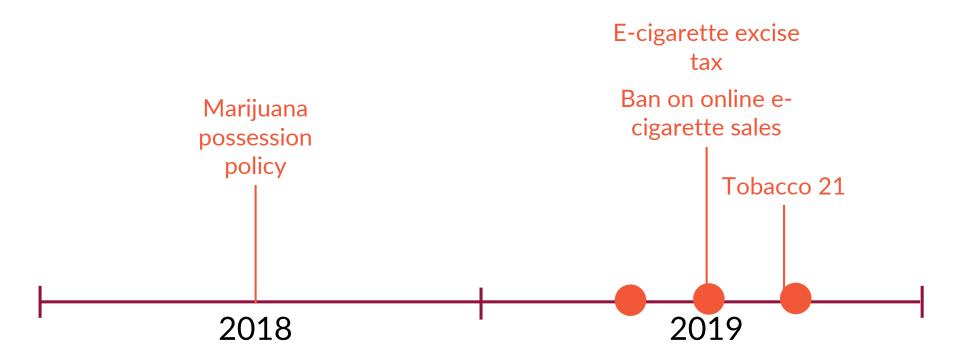
– Study aims:

- Aim 1: Assess changes in perceptions, patterns, and symptoms associated with vaping nicotine and marijuana.
- Aim 2: Identify characteristics of those who vape nicotine and marijuana, as well as those who report symptoms consistent with vaping-related lung injury cases.
- Aim 3: Assess impact of UNHYPED and other e-cigarette prevention messages on vaping-related harm perceptions and patterns of use.

Rapid Response Example 2: Pre/post Tobacco 21

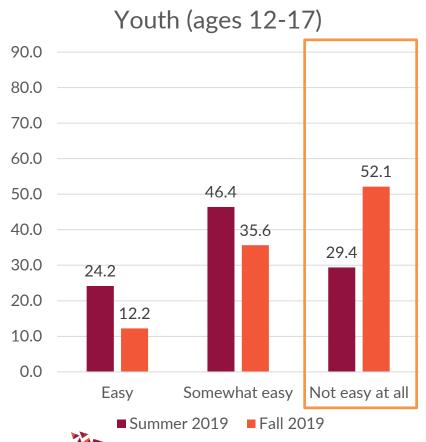
Unique items in PACE Vermont

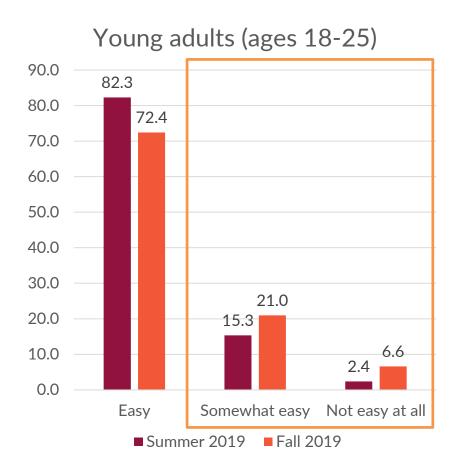
- Peer crowds
- Policy awareness and support
- Awareness of communication efforts



Ease of buying tobacco (weighted)

How easy do you think it is for people your age to buy tobacco products in a store?

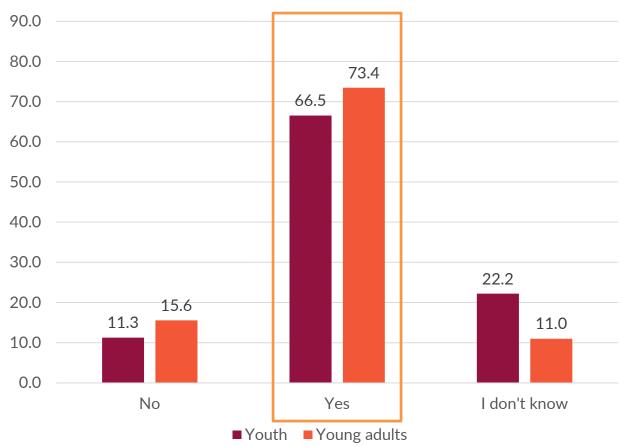






Tobacco21 awareness (weighted)

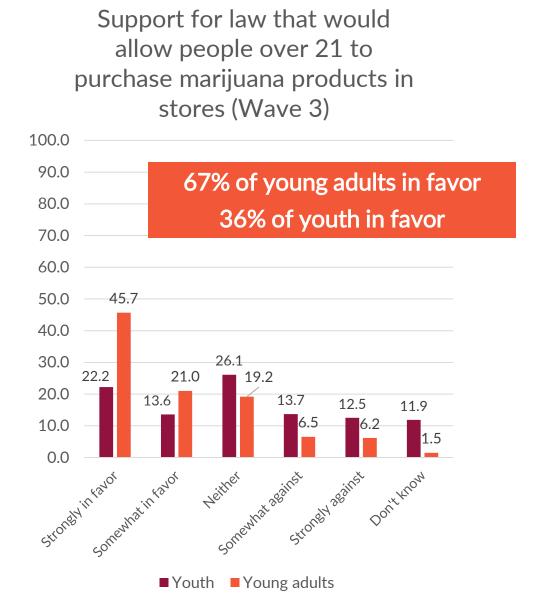
Does Vermont have a law that requires people to be 21 years old before they can purchase cigarettes, electronic vapor products, and other tobacco products?





Marijuana policy (weighted)

 58.8% of young adults accurately identify all components of VT's 2018 marijuana law, compared to 48.7% of youth (Wave 1)





Future directions

- NIH grant submitted Oct 2019 (R01)
 - "Effect of tobacco and cannabis policy on youth and young adult substance use beliefs and behaviors"
 - Five year grant
 - Collect 18 *new* waves of data in the PACE Vermont Study in 2021-2025

– Study aims:

- Aim 1: Assess changes in tobacco, alcohol, and cannabis use in Vermont youth and young adults over time following implementation of state-level tobacco and cannabis policies.
- Aim 2: Evaluate changes in product-specific harm perceptions in Vermont youth and young adults over time following implementation of state-level tobacco and cannabis policies.
- Aim 3: Assess impact of state-wide health communication efforts following tobacco and cannabis policies on tobacco, alcohol, and cannabis harm perceptions.

Rapid Response Example 3: Opioid

Opioid-related data

- Ever used
 - Prescription pain medication not as prescribed
 - Prescription stimulants not as prescribed
 - Any form of cocaine
 - Inhalants
 - Heroin
 - Methamphetamines
- Knowledge of VT opioid prescribing policy
- Ever prescribed opioids by a doctor
 - Discussion of non-opioid pain management with doctor
 - Took prescribed pain medication
- Awareness of state-level opioid media efforts

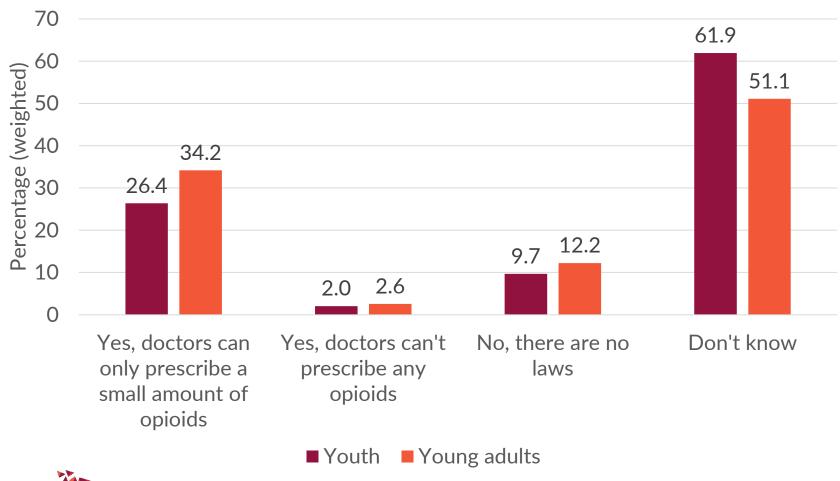
Ever other drug use at Waves 1 or 2, weighted

	YOUTH (12-17)		YOUNG ADULTS (18-25)	
	n	%	n	%
Other Drug Use:				
Have you ever used any of the following products? (Select all that apply.) ²				
1. Prescription pain medicine (count drugs such as codeine, Vicodin, OxyContin, Hydrocodone, or Percocet) without a doctor's prescription or differently than how a doctor told you to use it	24	4.2	142	15.0
2. Prescription stimulants (count drugs such as Adderall or Ritalin) without a doctor's prescription or differently than how a doctor told you to use it	14	2.0	212	20.2
3. Any form of cocaine, including powder, crack, or freebase	5	0.7	169	17.3
4. Sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high	14	3.3	42	5.0
5. Heroin (also called smack, junk, or China White)?	3	0.3	20	2.2
6. Methamphetamines (also called speed, crystal meth, crank, ice, or meth)	2	0.2	22	2.9



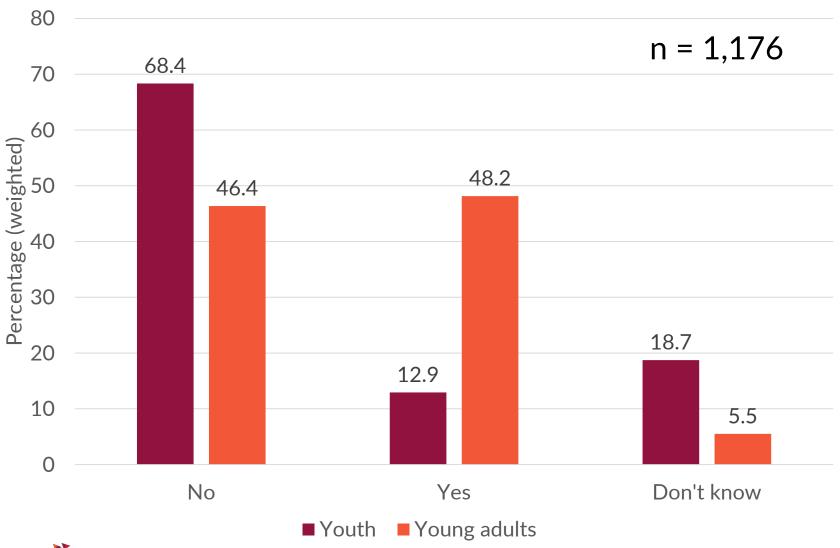
Knowledge of opioid policy

Are there laws in VT about how much opioid medication a doctor can prescribe?



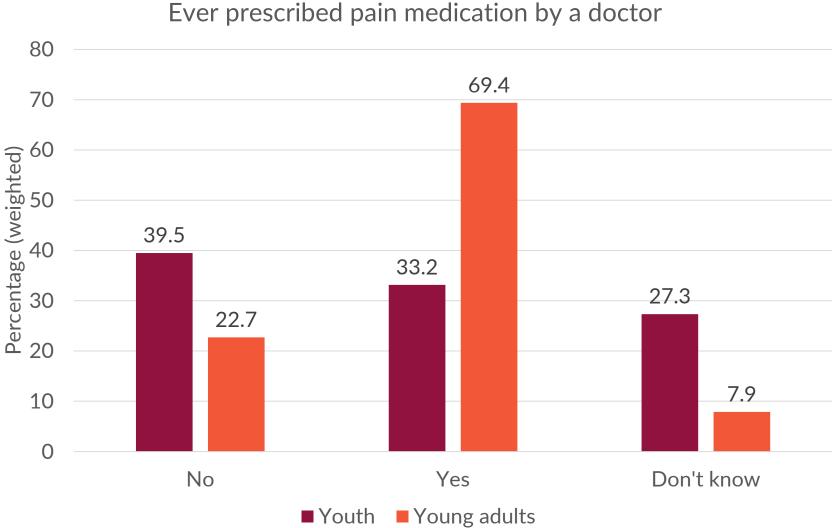


Ever prescribed pain medication by a doctor?





Misuse of pain medication (n = 132; 11%)





Opioid-related education

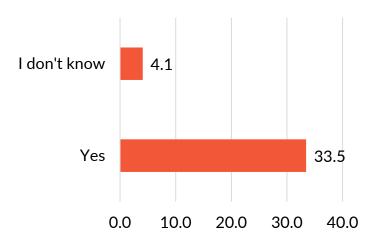


https://overthedosevt.com/



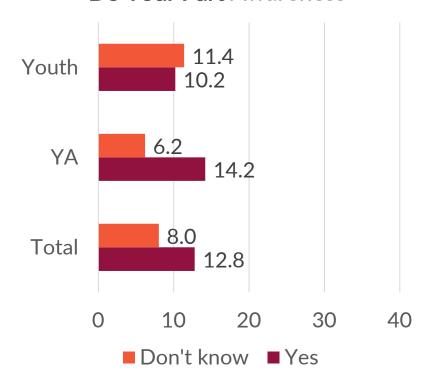
When you properly store and get rid of unused medications, you're doing your part to keep Vermonters—and Vermont—healthy and safe.

Over the Dose Awareness - YA only



Vermont Wave 1, Spring 2019

Do Your Part Awareness



Rapid Response Example 4: Flavored tobacco use



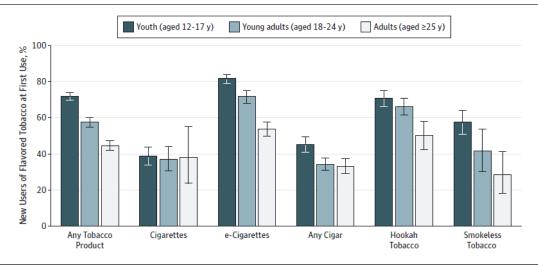


Original Investigation | Public Health

Association of Flavored Tobacco Use With Tobacco Initiation and Subsequent Use Among US Youth and Adults, 2013-2015

Andrea C. Villanti, PhD, MPH; Amanda L. Johnson, MHS; Allison M. Glasser, MPH; Shyanika W. Rose, PhD, MA; Bridget K. Ambrose, PhD, MPH; Kevin P. Conway, PhD; K. Michael Cummings, PhD, MPH; Cassandra A. Stanton, PhD; Kathryn C. Edwards, PhD; Cristine D. Delnevo, PhD, MPH; Olivia A. Wackowski, PhD, MPH; Shari P. Feirman, PhD, MS; Maansi Bansal-Travers, PhD, MS; Jennifer K. Bernat, PhD; Enver Holder-Hayes, MPH; Victoria R. Green, BA; Marushka L. Silveira, BDS, MPH, PhD; Andrew Hyland, PhD





Flavored tobacco use, weighted

	Age a			
	12-17	18-25	Total	
	(%)	(%)	(%)	
Cigarettes				
First flavored	15.6	24.0	23.2	
Past 30-day flavored	36.0	32.0	32.3	
EVP				
First flavored	87.5	85.6	85.9	
Past 30-day flavored	80.5	83.9	83.3	







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First flavored use (Wave 1)	Youth (12-17)	Young adults (18-24)	Adults (25+)
Cigarettes	p12m, p30d	Current regular	Current regular
Menthol	p12m, p30d	Current regular	Current regular
Any cigars	-	Current regular	Current regular
E-cigarettes	-	Current regular	Current regular
Hookah	-	Current regular	Current regular
Any smokeless	p30d	Current regular	Current regular





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Table 4. Multivariable Multinomial Logistic Regression Models of Frequency of Use at Wave 2 Among Ever Users of Specified Product at Wave 1 of the Population Assessment of Tobacco and Health Study, by Age Group

			RRR (95% CI)				
Age Group	Participants, No.	No Past 12-mo Use	Past 12-mo Use, No Past 30-d Use	1-5 d in the Past 30 d	6-19 d in the Past 30 d	20-29 d in the Past 30 d	All 30 d in the Past 30 d
Youtha							
First cigarette flavored	1316	1 [Reference]	1.47 (1.09-1.98)	1.69 (1.20-2.40)	1.22 (0.72-2.07)	1.15 (0.61-2.18)	1.61 (1.10-2.38)
First cigarette menthol or mint flavored ^b	1223	1 [Reference]	1.60 (1.17-2.21)	1.93 (1.32-2.83)	1.33 (0.77-2.31)	1.23 (0.65-2.32)	1.88 (1.25-2.82)
First e-cigarette flavored	1045	1 [Reference]	1.26 (0.82-1.94)	1.30 (0.78-2.16)	1.40 (0.64-3.07)	1.08 (0.21-5.71)	2.85 (0.94-8.63)
Young adults ^c							
First cigarette flavored	4109	1 [Reference]	1.13 (0.90-1.41)	1.24 (1.00-1.55)	1.21 (0.93-1.57)	1.26 (0.86-1.86)	1.56 (1.27-1.93)
First cigarette menthol or mint flavored ^b	3925	1 [Reference]	1.13 (0.89-1.44)	1.21 (0.96-1.52)	1.24 (0.95-1.63)	1.30 (0.87-1.95)	1.66 (1.33-2.06)
First e-cigarette flavored	2622	1 [Reference]	1.52 (1.21-1.92)	1.61 (1.24-2.10)	2.35 (1.27-4.34)	0.81 (0.37-1.75)	3.24 (2.16-4.86)
Adults ^d							
First cigarette flavored	13 959	1 [Reference]	1.34 (1.09-1.63)	1.30 (1.07-1.58)	1.22 (0.96-1.56)	1.11 (0.86-1.43)	1.23 (1.11-1.35)
First cigarette menthol or mint flavored ^b	13 594	1 [Reference]	1.40 (1.14-1.73)	1.36 (1.10-1.67)	1.28 (1.00-1.63)	1.15 (0.89-1.48)	1.32 (1.20-1.45)
First e-cigarette flavored	5188	1 [Reference]	1.38 (1.19-1.61)	1.25 (1.02-1.53)	1.44 (1.03-2.01)	2.09 (1.09-4.00)	2.38 (1.90-3.00)

Short-term effect of Ontario menthol ban

Table. Expected, Short-term Actual, and Long-term Planned Reactions to the Ban on Menthol in Tobacco, Ontario, Canada

	No. (%; 95% CI) (n = 206)				
Reaction	Expected Reaction Before Ban	Actual Short-term Reaction ^a	Long-term Planned Reaction		
Use of nonmenthol cigarettes only ^b	123 (59.7; 52.8-66.2)	51 (28.2; 22.0-35.2)	102 (49.5; 42.7-56.4)		
Quit	30 (14.5; 10.3-20.1)	60 (29.1; 23.3-35.8) ^c	35 (17.0; 12.4-22.3)		
Use of alternative flavored products (e-cigarettes, cigars, and other flavored tobacco products)	12 (5.8; 3.3-10.2)	60 (29.1; 23.3-35.8)	6 (2.9; 1.3-6.4)		
Use of contraband menthol	23 (11.2; 7.5-16.3)	29 (14.1; 10.0-19.6) ^d	34 (16.5; 12.0-22.3)		
Adding menthol or other reaction	4 (1.9; 0.7-5.1)	29 (14.1; 10.0-19.6)	NR		
Don't know	14 (6.8; 4.1-11.2)	6 (2.9; 1.3-6.4)	29 (14.1; 10.0-19.6)		

Abbreviation: NR, not reported.

smoking by follow-up was 25 (12.1%; 95% CI, 8.3%-17.4%).

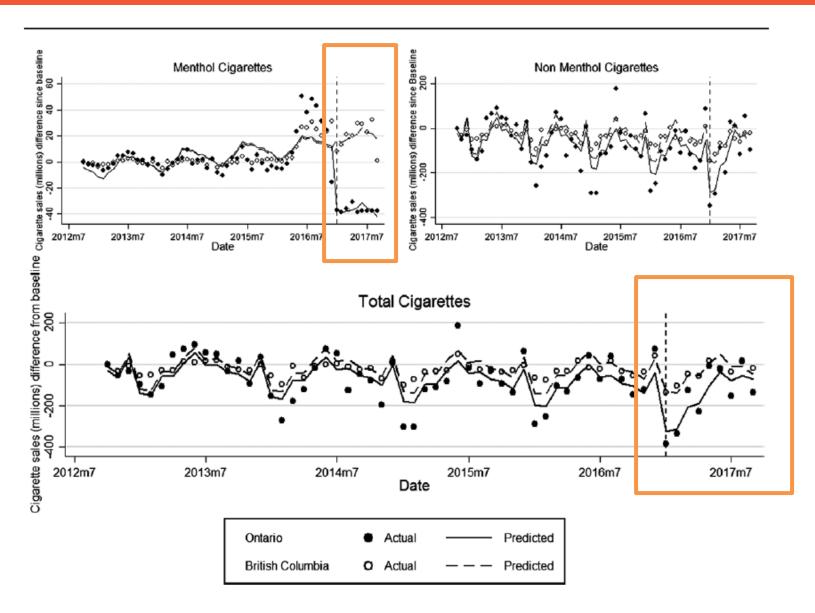
^a Column does not total 100% because actual behaviors were not mutually exclusive.

^b Continued or new users of nonmenthol cigarettes who did not try to quit, use any menthol product, use any other flavored product, or add flavor to nonmenthol cigarettes.

^c Quit or made serious quit attempt. The number (percentage) not currently

^d Purchasing menthol cigarettes from a First Nations reserve, other province, other country, or online. Does not include stockpiled cigarettes, cigarettes bought from existing stocks that enforcement allowed stores to sell out, or those provided by friends. A total of 72 individuals (35.1%; 95% CI, 28.9%-42.0%) used menthol from all sources in the past month.

Impact of Ontario menthol ban on sales



Chaiton M, et al. Nicotine Tob Res. 2019.

No impact on illegal cigarette seizures in Nova Scotia

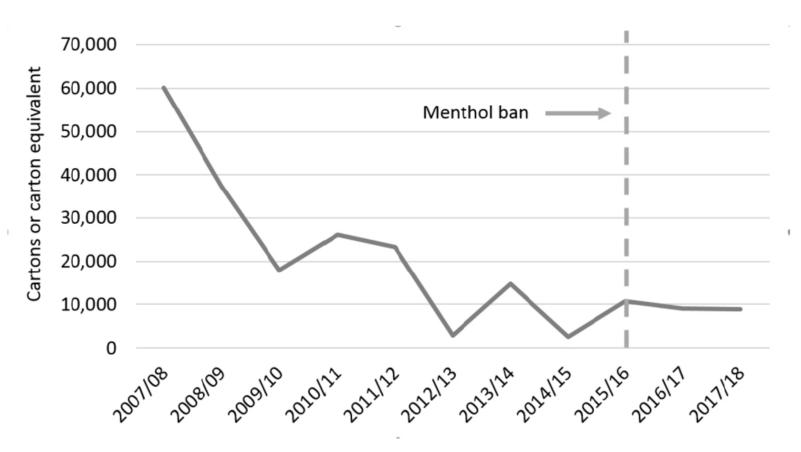
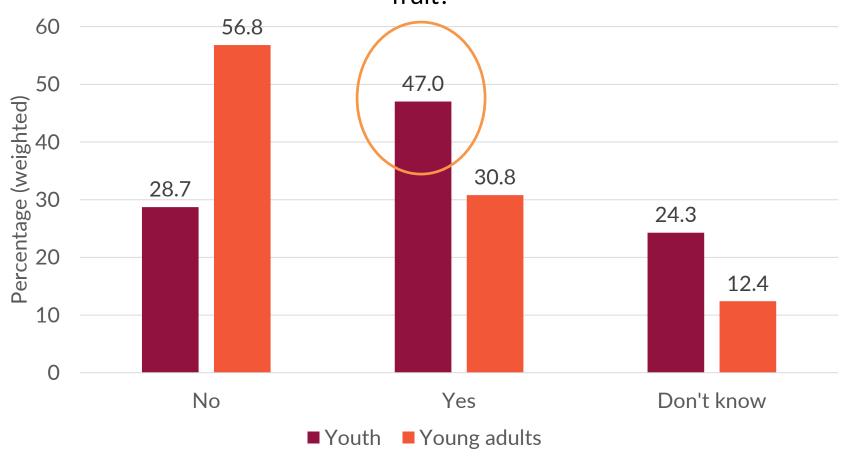


Figure 1 Number of illicit cigarettes seized in Nova Scotia, includes flavoured and unflavoured cigarettes. Note: The spike in quantity seized in 2013/2014 is attributable to two large seizures (5350 cartons and 2502 cartons, respectively). The increase in seizures in 2015/2016 relates to one investigation of illegal wholesaling/retailing and involved 83 separate seizures.

Stoklosa M. Tob Control. 2018.

Policy support: flavored tobacco ban (weighted)

Do you think it should be illegal for all tobacco products to be sold in flavors such as menthol, clove, chocolate, and fruit?





Future directions

Data sharing
 with state
 agencies,
 legislators, FDA

 Testifying for the Vermont legislature



What PACE offers

Rapid and flexible

 Add or remove questions to align with new policies or communication activities

Complement existing data

- National and statewide surveys
- Sub-studies or randomized experiments within the cohort on topics of interest

Peer crowds segmentation

Developing and evaluating marketing campaigns

Inform and support

- Substance use policies and campaigns
- Shared access to data
- Protocol for developing reports and other scientific products

What works for tobacco control?

Substance use prevention and treatment?

Comprehensive programs that seek to:

- Establish policies and norms to reduce use
- Promote cessation and assist users to quit
- Prevent initiation of use

Overarching components of comprehensive programs:

- State and community interventions, including policies
- Mass-reach health communication interventions
- Cessation/treatment interventions
- Surveillance and evaluation
- Infrastructure, administration, and management

Thank you to our fabulous team!!



...which has continued to grow!!



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