
**School and community level education
interventions to reduce nicotine use in teens
aged 13-17 in NYC public schools**

Why is this an issue?

- Nicotine has negative effects on health
- This is a growing problem
- Parents and schools are concerned

Vaping has negative effects on health

- Exposure to nicotine during adolescence can worsen memory and concentration (Debchoudhury et. al, 2022).
- Long term exposure to e-cigarette aerosol is concerning because of chronic exposure to toxic and carcinogenic chemicals (Debchoudhury et. al, 2022).
- The CDC has reported 2800+ cases of lung injury from vaping and 60+ confirmed deaths, since 2019.
- Nicotine is highly addictive, and young people who use e-cigarettes may be more likely to smoke cigarettes in the future (CDC).
- Continued e-cigarette use can lead to other substances abuse such as alcohol and cannabis use, in addition to use of other tobacco products.

Nicotine use is leading to other substance abuse

Table 1. Sample Characteristics of Baseline (Population Assessment of Tobacco and Health Wave 3) Cigarette-Naïve Adolescents, With Prevalence of Ever and Current e-Cigarette Use

Characteristics	Wave 3 never cigarette users (n = 8671)		Ever e-cigarette user (n = 842)		P value ^a	Current e-cigarette user (n = 138)		P value ^a
	Participants, No.	Weighted, % (95% CI)	Participants, No.	Weighted, % (95% CI)		Participants, No.	Weighted, % (95% CI)	
Age, y								
12-14	4823	55.4 (54.8-56.1)	231	4.8 (4.2-5.4)	<.001	36	0.8 (0.5-1.1)	<.001
15-17	3848	44.6 (43.9-45.3)	611	15.7 (14.6-16.9)		102	2.7 (2.2-3.3)	
Sex								
Male	4454	51.1 (50.5-51.8)	454	10.0 (9.1-11.1)	.24	74	1.8 (1.4-2.2)	.30
Female	4195	48.9 (48.3-49.5)	386	9.3 (8.5-10.1)		64	1.5 (1.2-1.9)	
Race and ethnicity								
Hispanic	2606	24.5 (23.9-25.2)	307	11.7 (10.4-13.2)		40	1.5 (1.1-2.1)	
Non-Hispanic								
Black	1199	14.2 (13.6-14.7)	114	10.6 (8.9-12.5)	.01	18	1.7 (1.1-2.8)	.40
White	3763	51.0 (50.3-51.8)	330	8.9 (7.9-10.0)		64	1.8 (1.4-2.3)	
Other ^b	792	10.3 (9.8-10.8)	75	8.6 (6.9-10.8)		12	1.0 (0.6-1.8)	
Highest parental education								
High school or general educational development or less	3057	31.7 (30.0-33.5)	341	11.2 (10.1-12.5)		50	1.7 (1.3-2.3)	
Some college	2700	31.2 (29.6-32.9)	288	10.9 (9.8-12.2)	<.001	44	1.8 (1.3-2.5)	.62
College or higher	2733	37.0 (34.9-39.3)	199	7.4 (6.3-8.6)		42	1.5 (1.1-2.0)	
Annual household income, \$								
<50 000	3956	43.7 (41.8-45.5)	419	10.9 (9.9-11.9)		57	1.5 (1.2-2.1)	
50 000-100 000	2082	26.7 (25.2-28.1)	202	9.3 (8.0-10.8)	.02	35	1.7 (1.2-2.4)	.77
>100 000	2060	29.7 (27.5-32.0)	169	8.3 (6.9-9.8)		39	1.8 (1.2-2.7)	
School grades								
Less than mostly Bs	2383	25.7 (24.5-27.0)	335	14.3 (12.8-15.9)	<.001	51	2.3 (1.7-3.1)	.02
Mostly Bs and higher	6228	74.3 (73.0-75.5)	501	8.0 (7.3-8.8)		85	1.4 (1.1-1.8)	
Family tobacco use								
Yes	2535	29.1 (27.6-30.6)	343	13.9 (12.3-15.6)	<.001	56	2.4 (1.8-3.1)	<.001
No	6004	71.0 (69.4-72.5)	487	7.9 (7.3-8.7)		80	1.3 (1.1-1.7)	
Secondhand smoke								
Yes	2393	28.2 (26.9-29.6)	370	15.6 (14.0-17.3)	<.001	73	3.2 (2.5-4.1)	<.001
No	6056	71.8 (70.4-73.1)	440	7.1 (6.6-7.8)		59	1.0 (0.8-1.3)	
Peer cigarette use								
Yes	1403	15.7 (14.7-16.7)	273	20.1 (17.8-22.6)	<.001	41	3.0 (2.2-4.1)	<.001
No	7216	84.3 (83.3-85.3)	565	7.7 (7.1-8.3)		95	1.4 (1.1-1.7)	
Ever used other tobacco products ^c								
Yes	438	5.3 (4.9-5.9)	214	49.7 (45.4-54.1)	<.001	44	10.9 (8.3-14.2)	<.001
No	7757	94.7 (94.1-95.2)	577	7.3 (6.7-8.0)		87	1.1 (0.9-1.4)	
Used alcohol in past 12 mo								
Yes	1508	18.9 (17.8-20.1)	365	23.5 (21.2-26.0)	<.001	65	4.3 (3.4-5.6)	<.001
No	6889	81.1 (79.9-82.2)	462	6.6 (6.0-7.3)		70	1.0 (0.8-1.3)	
Used cannabis in past 12 mo								
Yes	207	2.5 (2.2-2.9)	85	41.9 (34.7-50.0)	<.001	15	6.9 (4.0-11.6)	<.001
No	8169	97.5 (97.1-97.8)	608	7.3 (6.8-8.0)		88	1.1 (0.9-1.4)	
Susceptible to cigarettes								
Yes	2575	29.6 (28.5-30.7)	435	16.8 (15.3-18.5)	<.001	87	3.5 (2.7-4.4)	<.001
No	6068	70.4 (69.3-71.5)	404	6.6 (6.0-7.2)		51	0.9 (0.7-1.2)	
Internalizing problems ^d								
Low	4393	50.4 (49.1-51.7)	358	8.1 (7.3-9.0)		60	1.4 (1.1-1.8)	
Moderate	2398	28.1 (27.1-29.1)	220	9.1 (8.0-10.4)	<.001	25	1.1 (0.8-1.7)	<.001
High	1880	21.6 (20.5-22.7)	264	13.9 (12.1-15.9)		53	2.9 (2.2-3.9)	
Externalizing problems ^d								
Low	3792	42.9 (41.6-44.1)	285	7.5 (6.6-8.5)		47	1.2 (0.9-1.7)	
Moderate	2424	28.4 (27.4-29.4)	232	9.3 (8.1-10.7)	<.001	28	1.3 (0.8-1.9)	<.001
High	2455	28.8 (27.6-30.0)	325	13.1 (11.6-14.7)		63	2.6 (2.0-3.3)	

^a Pearson χ^2 test was performed to compare the prevalence of e-cigarette use across different groups of sample characteristics at wave 3.

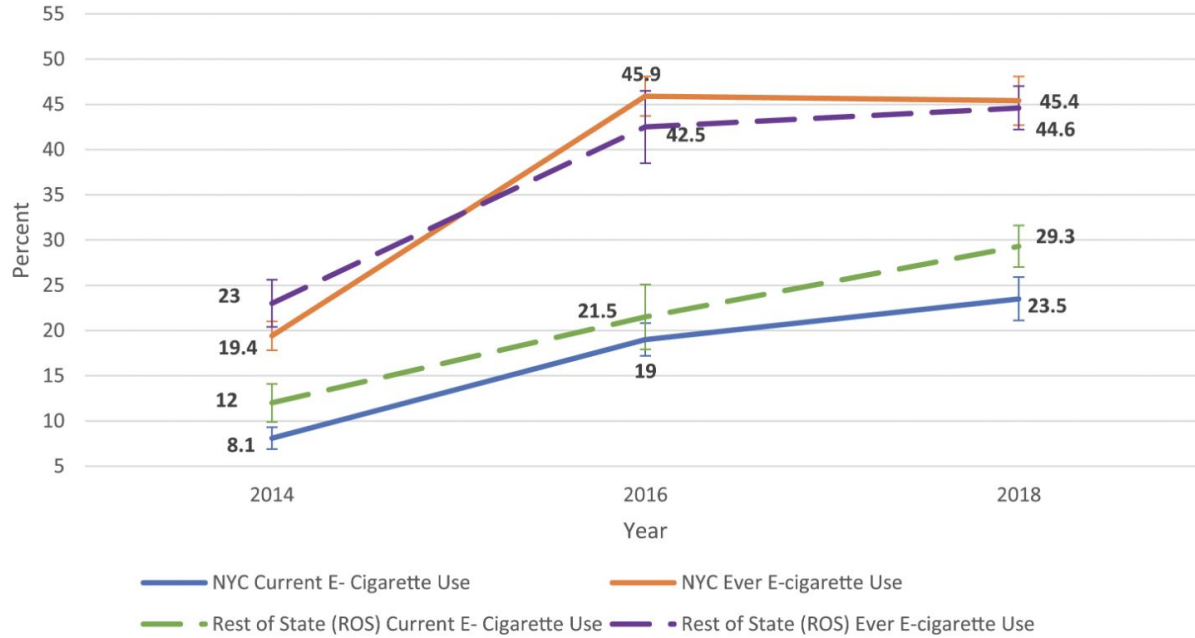
^b Non-Hispanic other includes American Indian or Alaska Native, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian, Native Hawaiian, Guamanian or Chamorro, Samoan, and other Pacific Islander.

^c Other tobacco products include cigar, pipe, hookah, snus, smokeless tobacco, bidi, kretek, and dissolvable tobacco.

^d Assessed by the Global Appraisal of Individual Needs-Short Screener.³⁴ Adolescents were classified as low (0-1 symptom), moderate (2-3 symptoms), or high (≥ 4 symptoms). See eTable 1 in Supplement 1 for details.

This is a growing problem

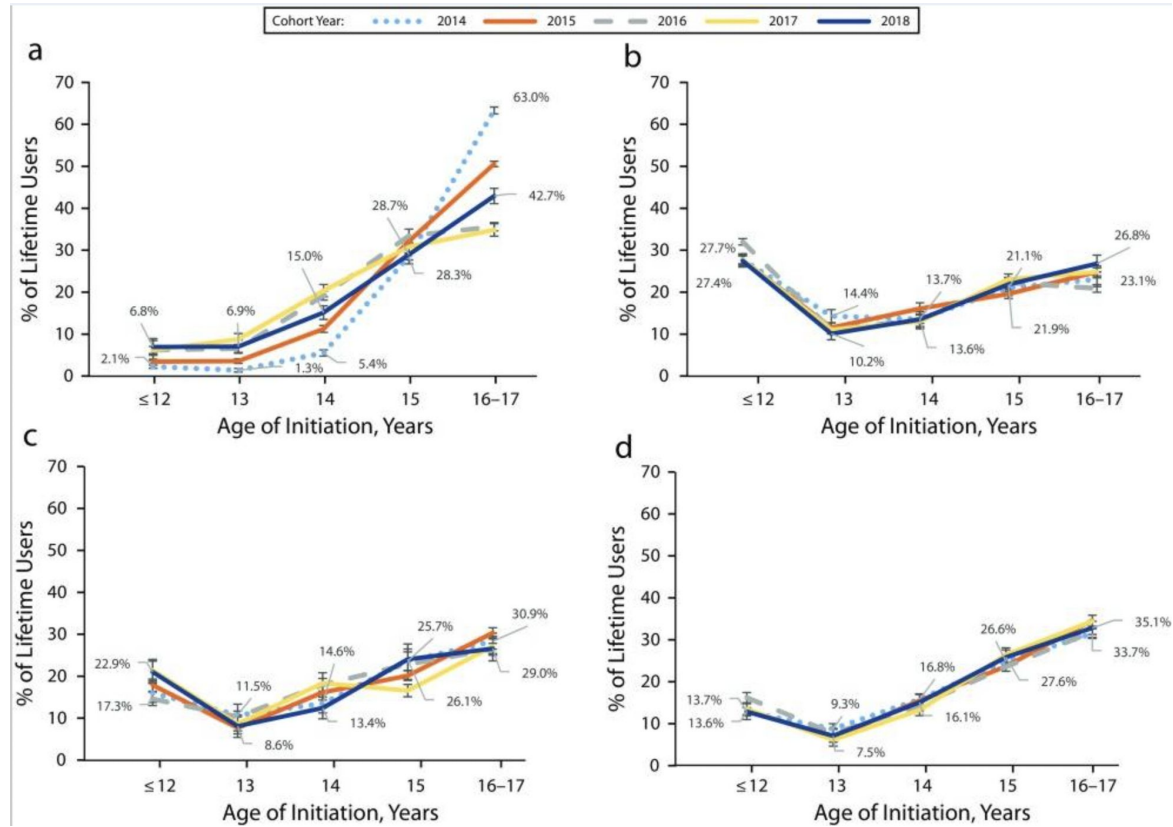
Current and Ever e-cigarette use among high school students by region, 2014-2018



Nationally, more than three million high school students used e-cigarettes in 2018 (Debchoudhury et. al, 2022).

**Error bars represent 95% confidence intervals

Adolescents are initiating e-cigarette use at a younger age.



- (a) E-Cigarettes
- (b) Cigarettes
- (c) Smokeless Tobacco
- (d) Cigars

Parents and schools are concerned

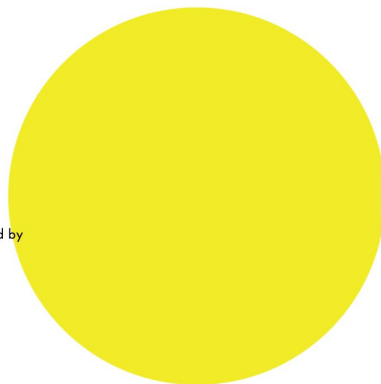


Vaping Companies & Big Tobacco Want To Hook Our Kids.

WE WANT TO STOP THEM.

Parents Against Vaping e-cigarettes (PAVe) is a national advocacy and education organization powered by volunteers.

GET INVOLVED



What Is the Vape-Free School Initiative?

One in four teens has vaped, and the number of middle and high school students



VAPE-FREE SCHOOLS INITIATIVE

using e-cigarettes further increased to 5.4 million in 2019, prompting the U.S. Surgeon General to call youth vaping an "epidemic."

Through our Vape-Free Schools Initiative, the American Lung Association is helping schools navigate this public health emergency with tools to protect and support both schools and students.

Being recognized as a member of the American Lung Association Vape-Free Schools Initiative means that your school is a leader in supporting students affected by e-cigarettes, offering clear guidance, education and cessation. With a toolkit of resources, we will help you share your efforts with students, parents, staff and community.

13-17 y/o teens in NYC public schools: How is nicotine use affecting them?

- The data we found shows significant increases in current e-cigarette use among high school students regardless of gender and race (Debchoudhury, et al. 2022)
 - Current e-cigarette use rose among both female (6.2% vs 23.9%) and male (10.4% vs 22.7%) high school students
 - Current e-cigarette use among White (6.7% vs 27.9%), Black (5.2% vs 12.6%), Latino (10.7% vs 34.1%), and Asian (5.0% vs 12.0%) high school students all increased

13-17 y/o teens in NYC public schools: How is nicotine use affecting them?

- Use is more concerning in this population → adolescent populations experience **more sensitivity to the effects of nicotine** (Goriounova, et al. 2012)
 - Possibility of worsening memory and concentration, impacting learning ability, and causing dependence during a period of heightened susceptibility
- Harmful chemicals and carcinogens in e-cigarette liquids and aerosols poses negative long term health effects in youth populations (Mantey, et al. 2016)

Why are teens more at higher risk to try e-cigarette products?

- Initially, E-cigarettes were marketed as a **safe and new alternative** to conventional/traditional cigarettes without major evidence of long term risks, which is particularly concerning for youth populations
- Increased vulnerability is tied to multiple factors:
 - Exposure to e-cigarette marketing via **internet, print, retail and TV/movies** is significantly associated with use of e-cigarettes (Mantey, et al. 2016)
 - Most commonly selected reason for use amongst this population was related to peer and family use (39%) (Debchoudhury, et al. 2022)
 - Availability of flavors follows closely behind (31%) (Debchoudhury, et al. 2022)
 - Perceived lower risk than other forms of tobacco (17%) (Debchoudhury, et al. 2022)

Are there specific at risk groups?

- Whilst our intervention is focused and targeted on **all NYC public school students aged 13-17** – research has shown that certain **subpopulations** are at increased risk for nicotine use
 - LGBTQ+ youth in this age range were found to have a higher prevalence of ever using e-cigarettes → 0.0% for the sample overall and significantly higher amongst sexual minority vs heterosexual (40.0% vs 27.0%) (Garcia, et al. 2021)
 - Higher SES groups with more exposure to e-cigarette advertising were also at increased risk for greater susceptibility and ever using e-cigarettes (Simon, et al. 2018)
- These populations are important to address moving forward → we want our intervention to encompass all students to ensure that no group is left behind

Behavior, Addiction, and Potential Harmful Effects

- **Behavior:**

Are actions, conduct, or patterns of activity engaged in individuals.

Influenced by various factors such as peer pressure, curiosity, stress, or seeking pleasure.

- **Addiction:**

A complex condition characterized by compulsive engagement in rewarding stimuli (dopamine)

Involves a loss of control and continued engagement despite negative consequences

Can be caused by substances like drugs or nicotine

- **Vaping and Nicotine:**

Nicotine addiction can lead to dependence and withdrawal symptoms

May have negative impact on brain development, attention, and learning

Potential gateway to other substance abuse

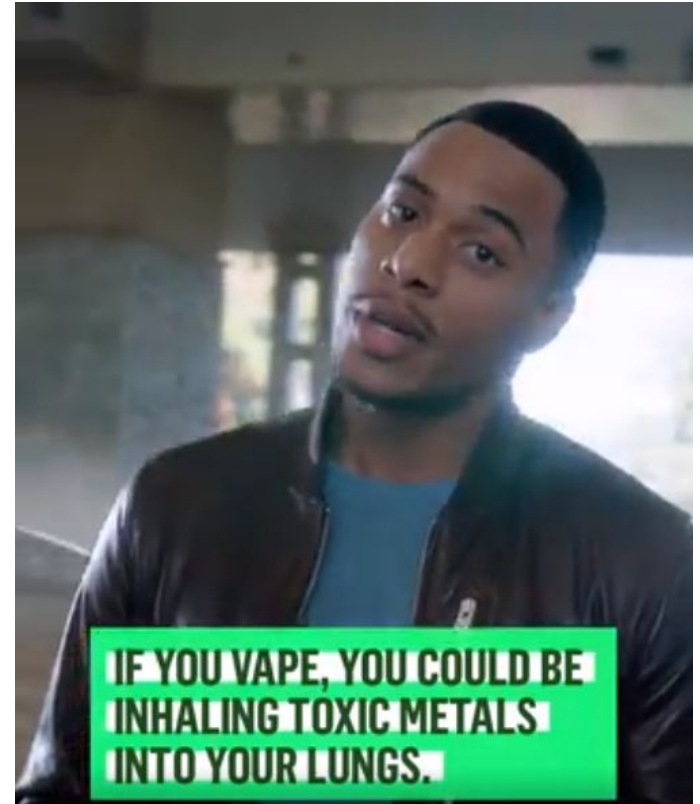
What behavior should we be advocating for a change?

- We should focus on the behavior of **Experimenting** with Vaping and Nicotine Products among teens.
- The goal is to **prevent or reduce** the initiation of use among teenagers.
- Research backed by behavioral specialist shows that experimentation with vaping and nicotine products may lead to **addiction, health risks, and potential long-term consequences.**
- One of the Interventions we propose are **network-Informed Peer-Led Prevention Programs implemented in schools.**
- This is a network-informed intervention that can use **peer leaders** to decrease substance use acceptability through school-wide campaigns and informal peer communication



Intervention + Implementation Plan

- In general, our intervention will aim to provide **education, awareness, and support** to discourage teenagers from trying, initiating or continuing the use of vaping and nicotine products.
- Our plan includes:
 - **School-level interventions** through educational programs, and
 - **Community-level interventions**, which can be achieved through advertising and social media campaigns.
- The intervention will be implemented at the start of the school year, and will be maintained across **5 year span** from 8th grade to 12th grade.



School-level Interventions

- **Aim: deterring middle school aged children from engaging in nicotine use**
 - Tasking a volunteer group with **training teachers and other educators** on how they can introduce the subject of nicotine use (e-cigarette use) in the classroom
 - Using training to educate students early on about the dangers of nicotine use, particularly vaping
 - Implemented in the form of **teacher guided discussions** where groups of students are assigned different articles on the consequences of e-cigarette use and round-up to talk over their findings
- The curriculum in these guided discussions will aim to →
 - Provide reduction in nicotine vaping use
 - Increase nicotine vaping knowledge → especially the true harmful effects
 - Increase positive perceptions of a vape-free lifestyle
- Curriculum will be available for different grade levels to allow every student the best chance to learn
- District wide notice will be sent out to allow administration, teachers, support staff, parents and students alike to be aware of the program

School-level Interventions, continued

- Along with teacher led discussions and learning activities – the intervention has other moving parts that allows for **thorough education delivery**
 - Utilizing **volunteer speakers in school assemblies** who can provide valuable insight on consequences of e-cigarette use
 - Experiencing the consequences of e-cigarette use firsthand can discourage students from trying or continuing to use these products
 - Holding **conferences** where educators can provide parents with effective strategies for engaging their children in dialogue about the hazards of vaping
 - pamphlets, handouts and other materials created based off the curriculum distributed → Material learned in school is reinforced at home
 - Incorporating **peer-led discussions** crafted based on the curriculum
- Currently, similar school-wide interventions are funded by CVS Health, so funding for this program can also come from major health orgs, local public health orgs, and/or taxpayer dollars from school funding for education-based programs.

Community-level Interventions

- Using streaming services or social media platforms to create ads informing audiences about the implications of using nicotine products (e-cigarettes).
- CDC Best Practices estimates that media campaigns need to reach ~ 75% of their target audience. With this sufficient level of exposure, shifts in attitude are expected in 12 to 18 months, and behavioral change is expected within 18 to 24 months following the campaign's launch.
- Look to “The Real Cost” commercials funded by the FDA that aired during the 2010s against cigarette use, and later against vaping in 2018.

Example: “The Real Cost” Ads

Content:

- Emphasizing loss of control due to addiction
- Depicting the dangerous chemicals found in cigarettes
- Reinforcing the negative health consequences of smoking in a way that speaks to youth

Success:

- For every \$1 spent, the campaign saved \$128 in costs associated with smoking-related harms.
- Exposure to the campaign nationally is estimated to have prevented 380,000 - 587,000 youth from beginning to smoke between 2013 and 2016.

Our Ad Campaigns

- Considering the success of “The Real Cost” ads, we can model ours similarly in the overall content and funding structure (by the FDA).
- However, to better target the middle school age group, we would:
 - Have a more engaging script
 - Utilize popular social media influencers
 - Target ads on apps commonly used by tweens and teens, such as TikTok and Instagram, or streaming platforms, like Hulu.

Stakeholders

Academia: Adolescents aged 13-17 can be effectively educated about the risks of nicotine use through a comprehensive approach involving educational videos, informative articles, and first hand accounts of complications from in-person speakers

Community: community norms possess the power to bring people together; generates greater support.

The Media: can be used as a vehicle for not only public discourse but health education, promotion, and communication for nicotine cessation



Measures of Success

1. Data from New York State (NYS) Youth Tobacco Survey (YTS), which is a biennial, school-based, self-administered survey, will be aggregated and tracked
2. Similarly to the Catch My Breath program, which has a 3 month follow-up survey of 11 T/F or MC questions, we will send out a survey every month.
 - a. Our survey will aim to assess attitudes/perceptions, likelihood of trying/continuing e-cigarette use, current status of e-cigarette use and overall progress of the curriculum in steering students away from e-cigarette use
3. After educational presentations or speaker events, pre and post survey knowledge assessments will track how much information the students have retained.

Foreseeable barriers/limitations

Funding: Sustaining program funding for training resources, materials for the programs, program staff efforts, and media campaign can be challenging. It may be difficult to find speakers who would want to volunteer to promote this without being compensated. We can attempt to overcome this barrier by accurately estimating expenses and creating a comprehensive budget that incorporates both time and costs associated with relationship development, capacity building, staff training, and evaluation.

Staff Training: Staff turnover and limited time for existing staff makes it difficult for them to become familiar with the program. We can overcome this by making sure that staff have access to ongoing support and training on the program itself. Continuous evaluation of the program is necessary to identify whether staff members require further training in order to effectively facilitate its implementation.

Foreseeable barriers/limitations, continued

Stakeholder Approval/Engagement: It may be difficult to gain support/approval from school faculty, city officials, and parent associations. We can overcome this barrier by educating those who may disagree with this plan with the current data of the harmful effects of nicotine.

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