

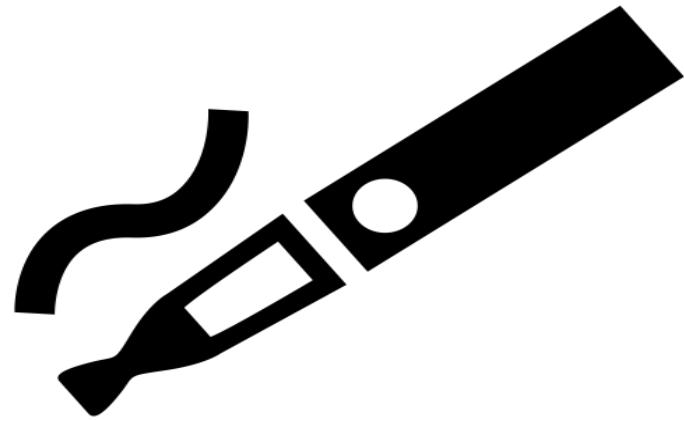


# E-Cigarettes and Vape Pens 101



STANFORD  
UNIVERSITY

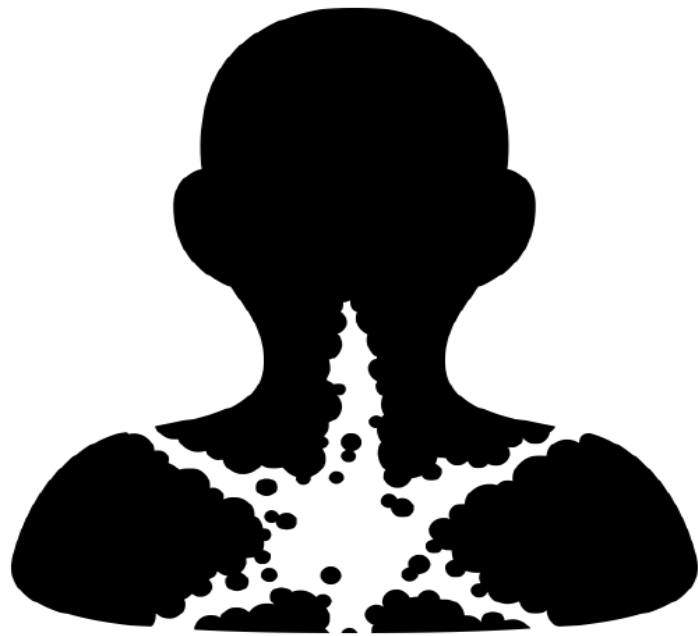
# In this presentation



**E-Cigarette Basics**



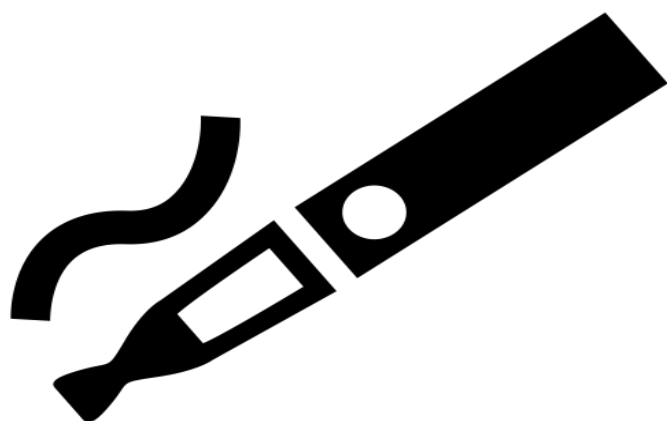
**Aerosol Contents**



**Health Risks**

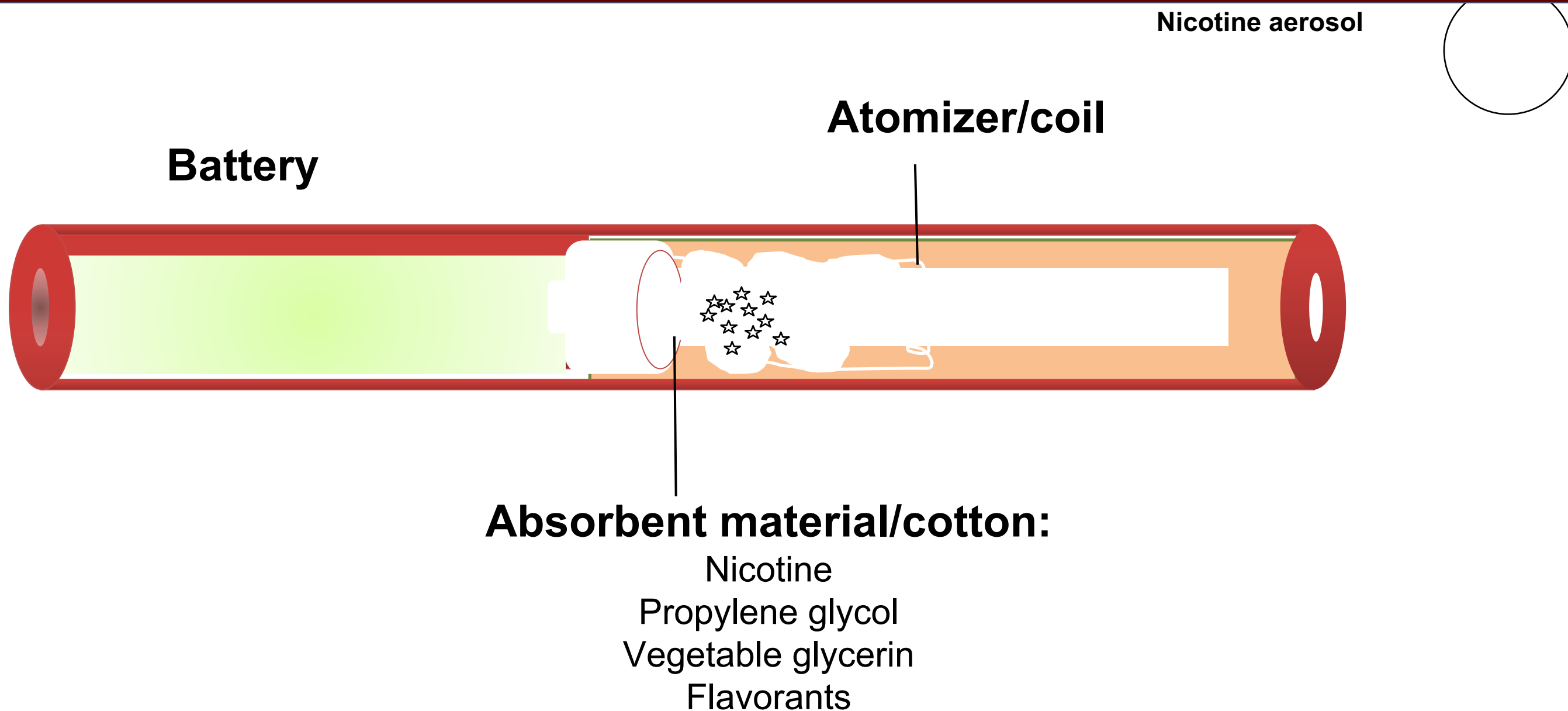


**Marketing Tactics**



## **E-Cigarette/Vape Pen Basics**

# What Are E-Cigarettes?



# Early Products



**RECHARGEABLE KIT**

**Vapors™**  
Disposable

**Intro Kit**  
Rechargeable

**FlavorMax™**  
Cartridge Refills



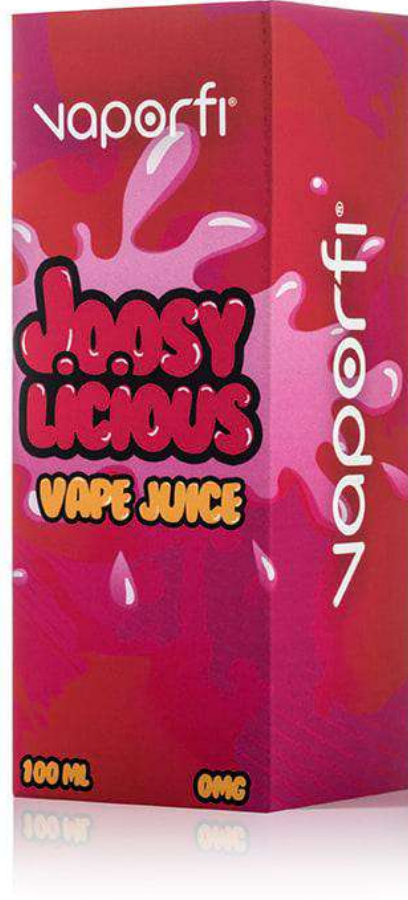
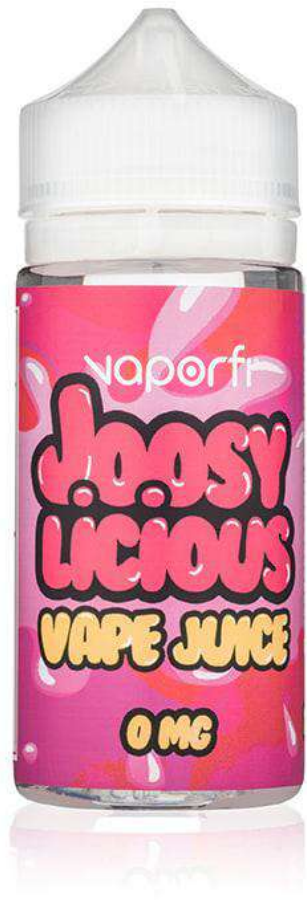
# Next Generation

JUUL





# E-Juice/E-Liquid

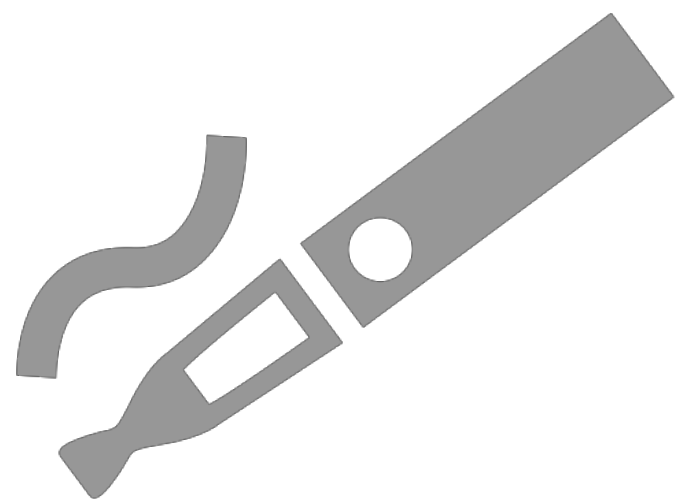


## E-Liquid Ingredients

### Nicotine

Propylene Glycol  
Vegetable Glycerin  
Flavoring Chemicals





## E-Cigarette Basics



# E-Cigarettes/Vape Pens: Just Water Vapor?



# It's an Aerosol, Not a Vapor



# Cigarette Chemicals

- Propylene glycol
- Glycerin
- Flavorings (many)
- Nicotine
- NNN
- NNK
- NAB
- NAT
- Ethylbenzene
- Benzene
- Xylene
- Toluene
- Acetaldehyde
- Formaldehyde
- Naphthalene
- Styrene
- Benzo(b)fluoranthene

- Chlorobenzene
- Crotonaldehyde
- Propionaldehyde
- Benzaldehyde
- Valeric acid
- Hexanal
- Fluorine
- Anthracene
- Pyrene
- Acenaphthylene
- Acenaphthene
- Fluoranthene
- Benz(a)anthracene
- Chrysene
- Retene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene

- Benzo(ghi)perylene
- Acetone
- Acrolein
- Silver
- Nickel
- Tin
- Sodium
- Strontium
- Barium
- Aluminum
- Chromium
- Boron
- Copper
- Selenium
- Arsenic
- Nitrosamines
- Polycyclic aromatic hydrocarbons

- Cadmium
- Silicon
- Lithium
- Lead
- Magnesium
- Manganese
- Potassium
- Titanium
- Zinc
- Zirconium
- Calcium
- Iron
- Sulfur
- Vanadium
- Cobalt
- Rubidium

# Which Chemicals Are Found in E-Cig/Vape Pen Aerosol?

- Propylene glycol
- Glycerin
- Flavorings (many)
- Nicotine
- NNN
- NNK

- Chlorobenzene
- Crotonaldehyde
- Propionaldehyde
- Benzaldehyde
- Valeric acid
- Hexanal

- Benzo(ghi)perylene
- Acetone
- Acrolein
- Silver
- Nickel
- Tin

- Cadmium
- Silicon
- Lithium
- Lead
- Magnesium
- Manganese

**All of these have been found in e-cigarette/vape pen aerosol**

- NAB
- NAT
- Ethylbenzene
- Benzene
- Xylene
- Toluene
- Acetaldehyde
- Formaldehyde
- Naphthalene
- Styrene
- Benzo(b)fluoranthene

- Acenaphthylene
- Acenaphthene
- Fluoranthene
- Benz(a)anthracene
- Chrysene
- Retene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene

- Aluminum
- Chromium
- Boron
- Copper
- Selenium
- Arsenic
- Nitrosamines
- Polycyclic aromatic hydrocarbons

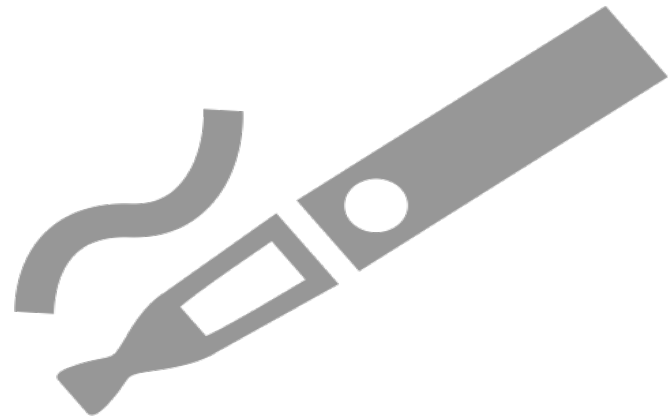
- Potassium
- Titanium
- Zinc
- Zirconium
- Calcium
- Iron
- Sulfur
- Vanadium
- Cobalt
- Rubidium

Compounds in yellow are from FDA 2012, Harmful and Potentially Harmful Substances – Established List

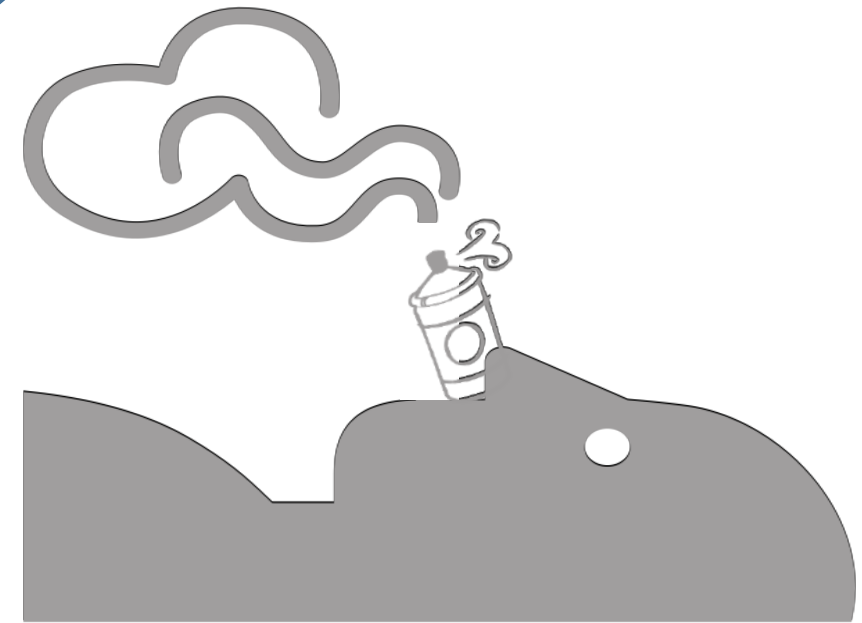


# Nicotine Amounts





**E-Cigarette Basics**

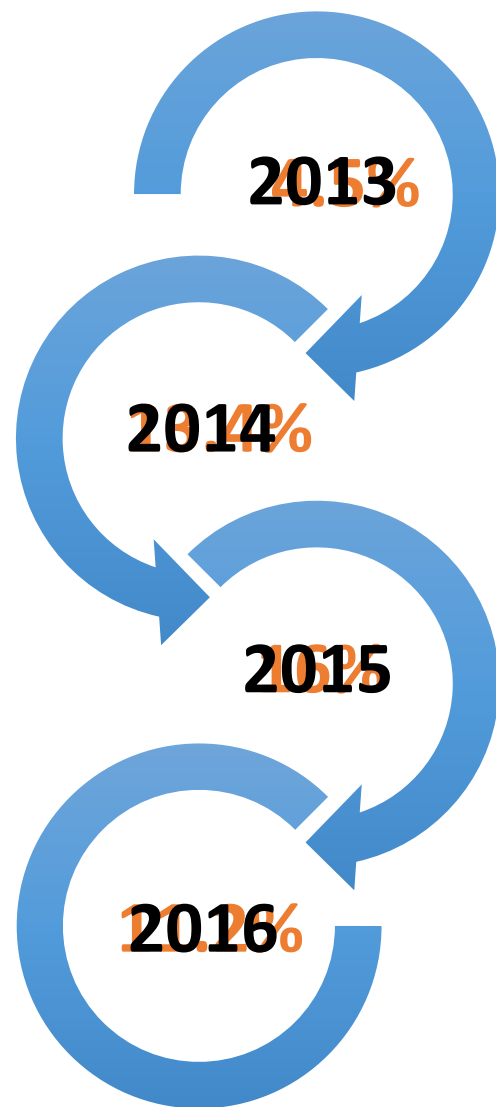


**Aerosol Contents**



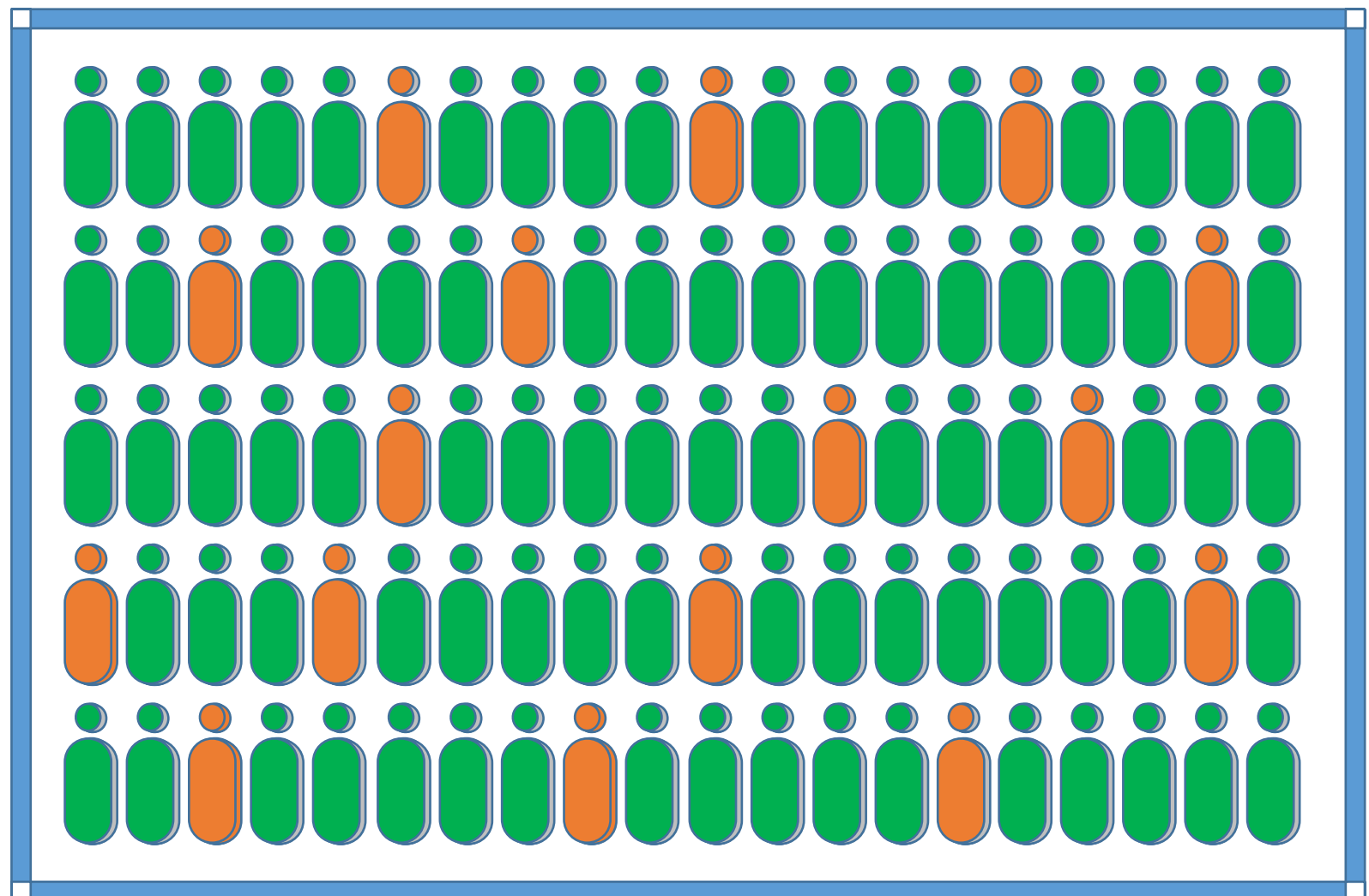
**Health Risks**

# Frequency



E-Cigarettes/Vape Pens User

Non-User



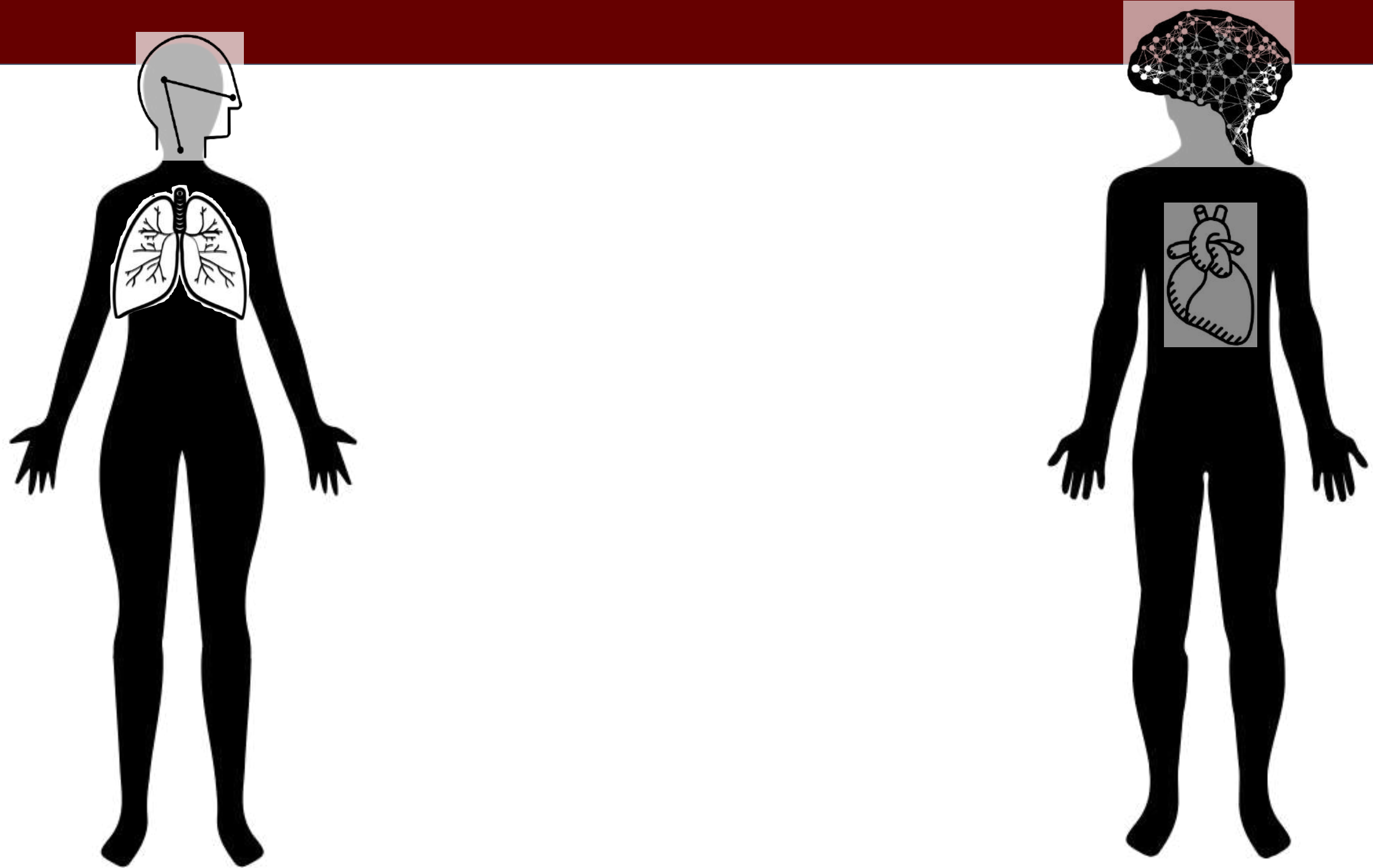
1  
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**For the first time, vaping use has decreased for youth!**



# Health Risks to E-cigarette/Vape Pen User



# Long-Term Health Effects

SCIENCE HEALTH

## Nicotine in e-cigs is not only addictive, it might also increase your risk of heart disease

*Nicotine can affect a smoker's health in more than one way*

by [Alessandra Potenza](#) | [@ale\\_potenza](#) | Sep 20, 2017, 4:00pm EDT



SHARE



TWEET



LINKEDIN



26

## Possible New E-Cigarette Health Risk: Cardiovascular Disease

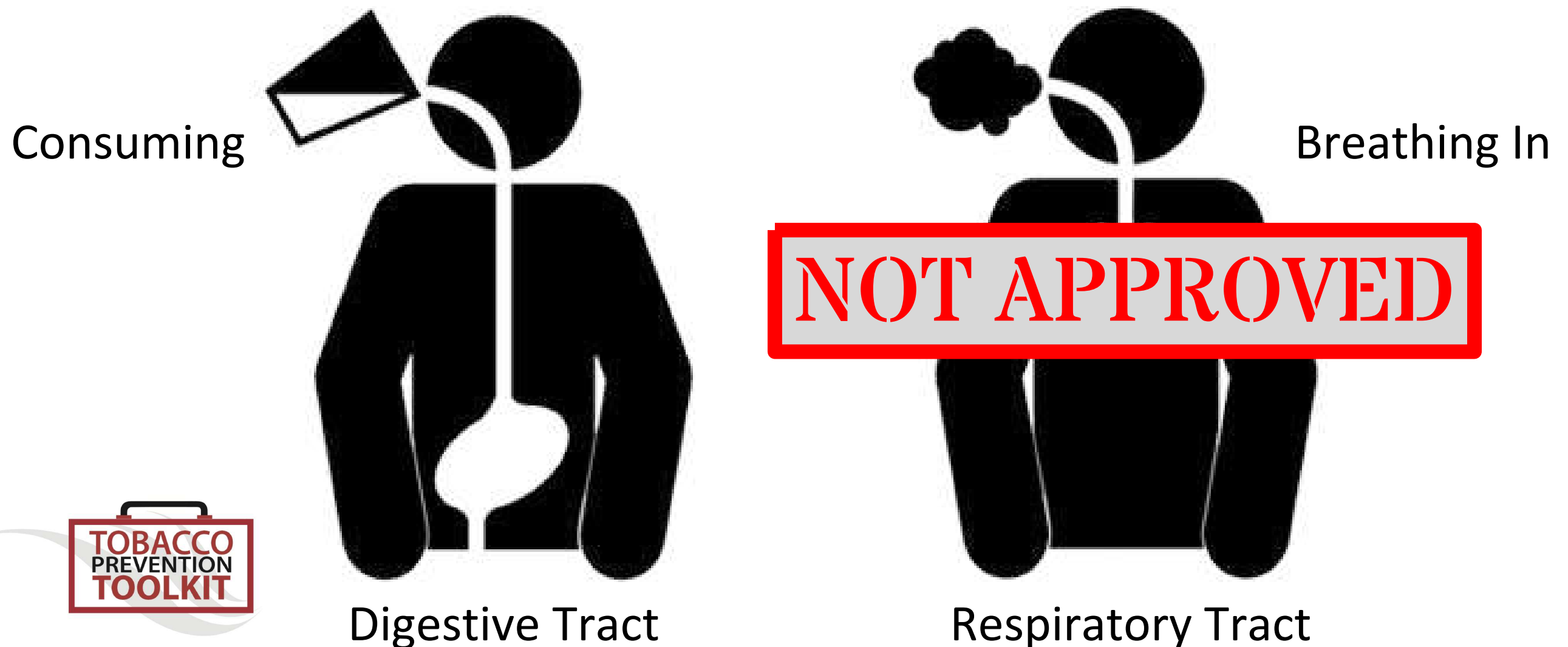
New research reveals a possible link between electronic cigarettes and heart problems

By Jeneen Interlandi  
February 01, 2017



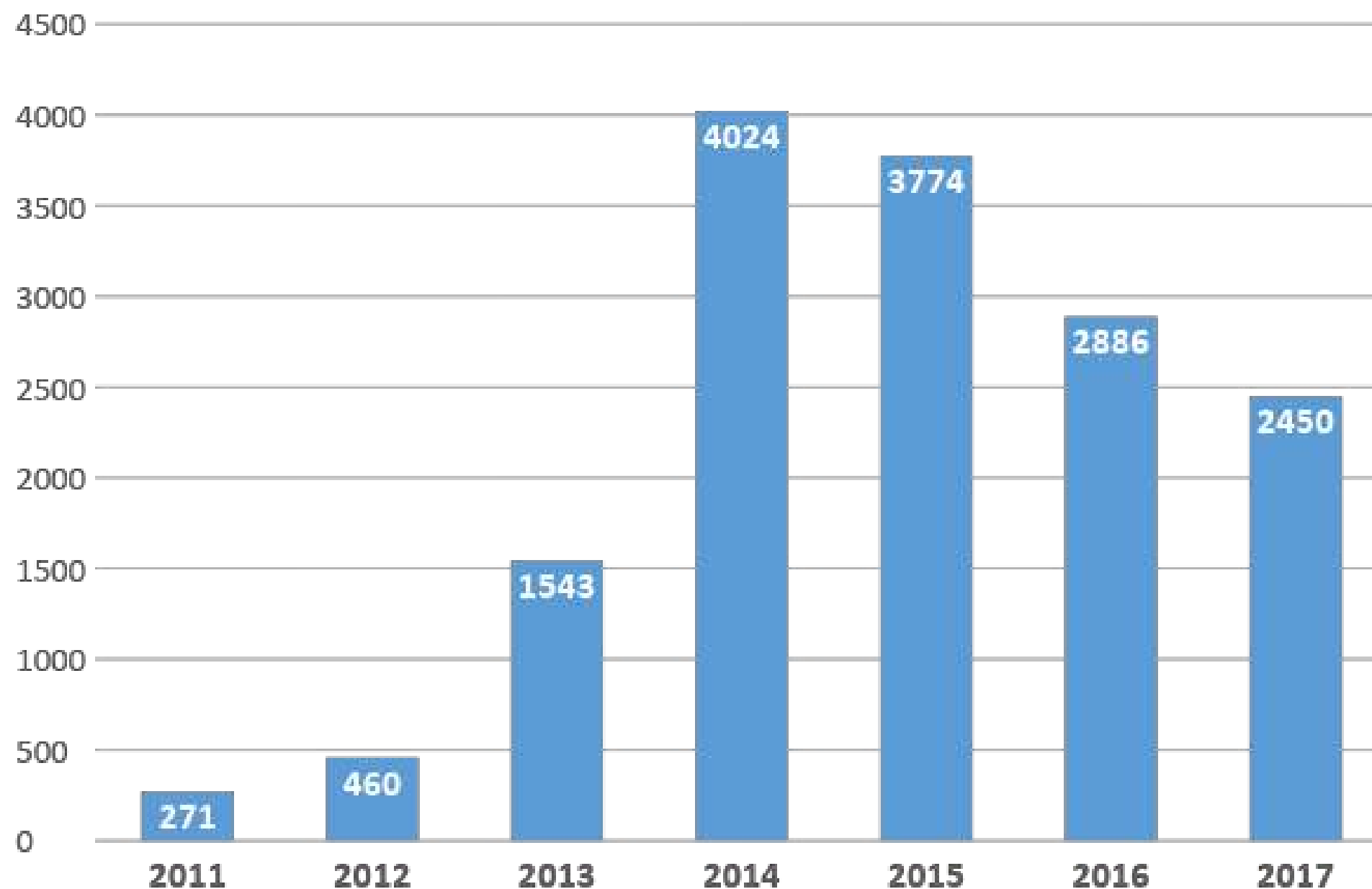
# Ingestion vs. Inhalation

Propylene glycol has been approved by the government for use in food ...**but** has **NOT** been approved for inhaling!

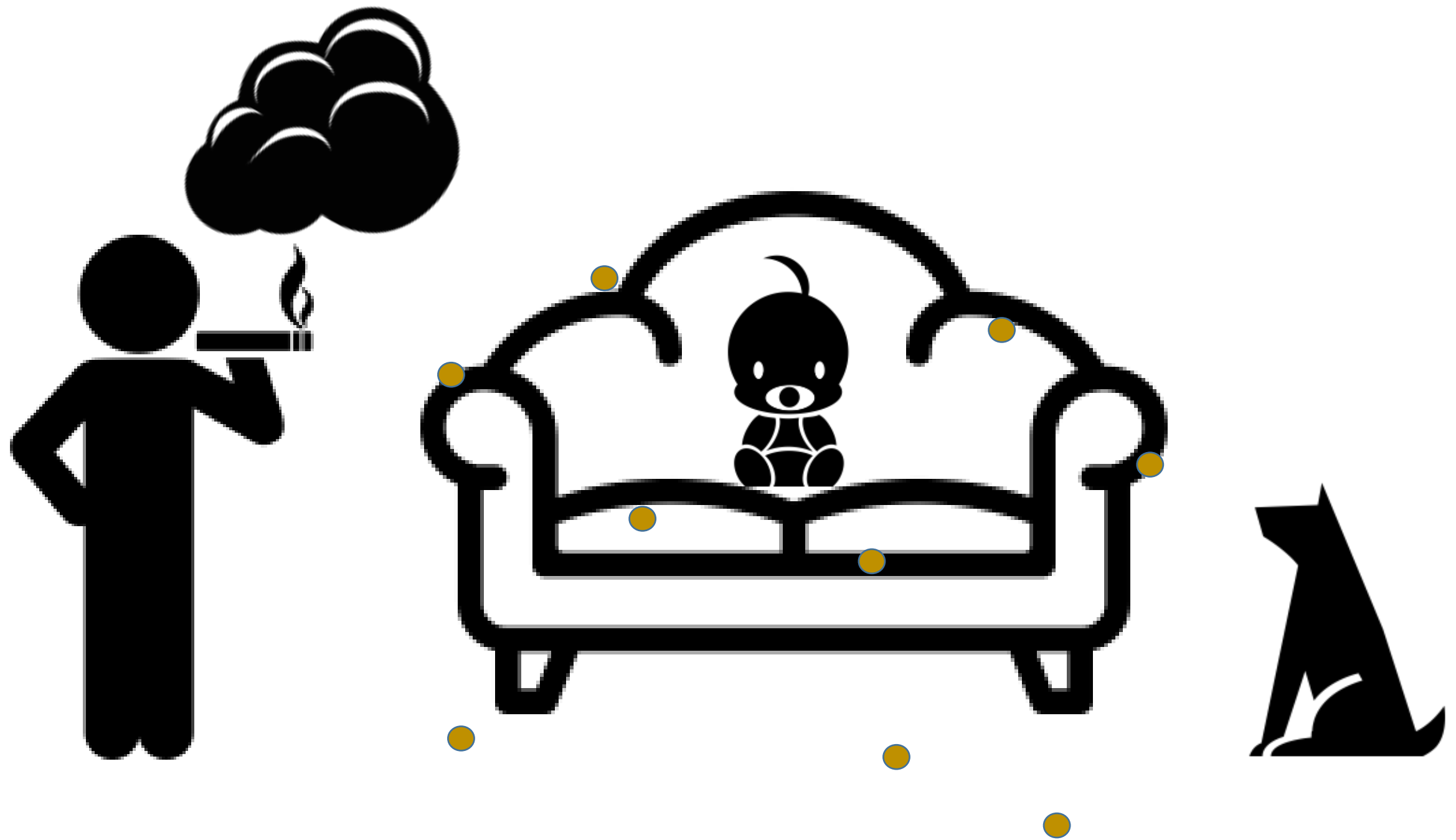


# Health Effects on Others

exposure  
s to e-cigs  
and liquid  
nicotine



# Thirdhand Smoke



Nicotine & other chemicals



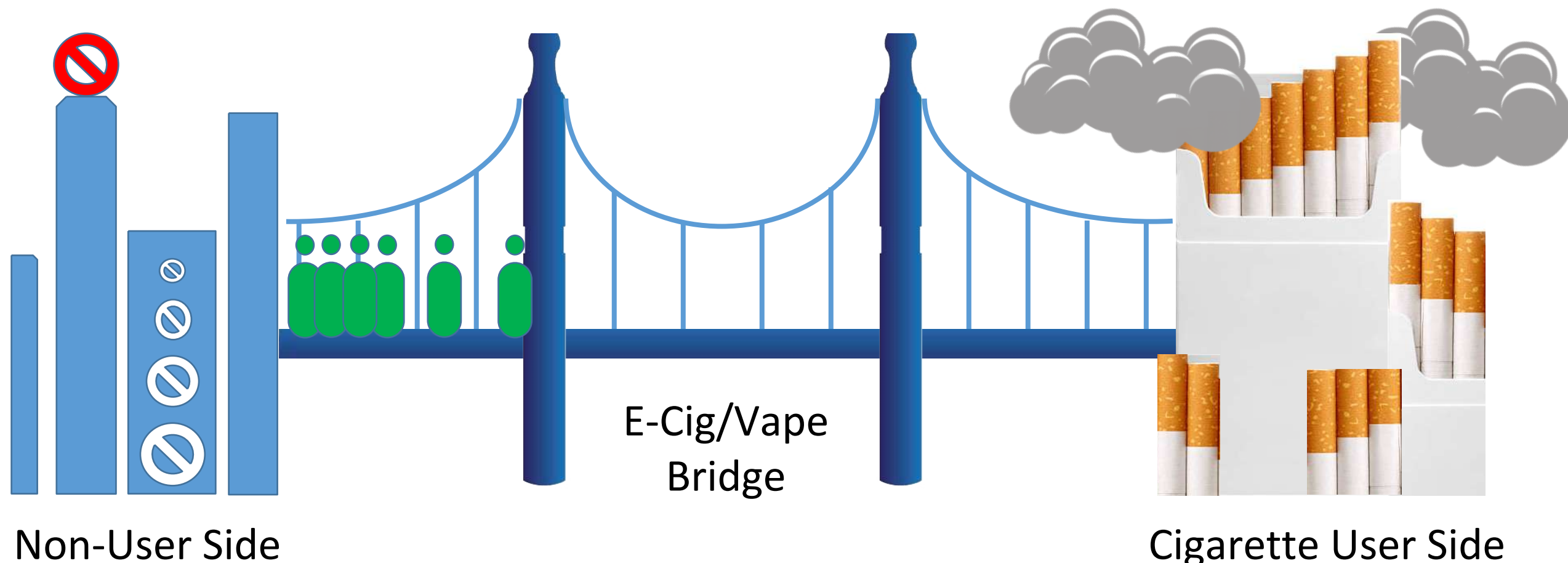
# E-Cigarette Explodes



[https://www.youtube.com/watch?v=dTr\\_h6be7ig](https://www.youtube.com/watch?v=dTr_h6be7ig)

# E-Cigarette/Vape Bridge to Cigarettes

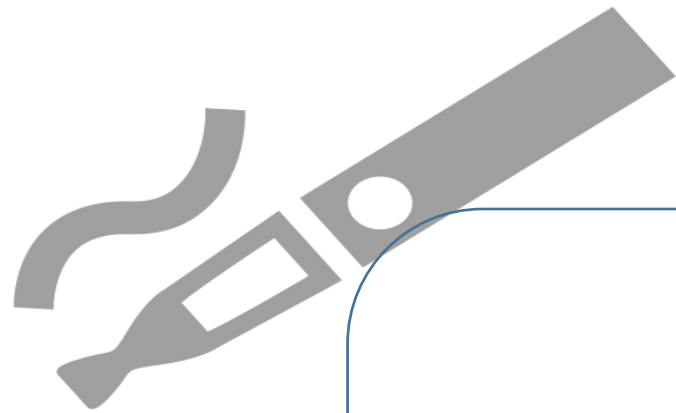
Adolescents who vaped were 4 times more likely to report cigarette smoking



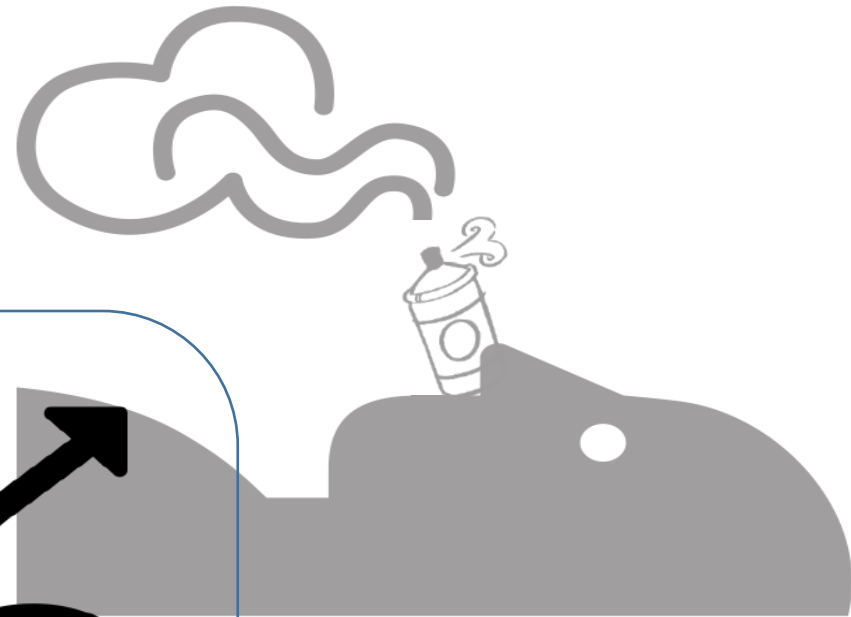


# Effects of E-Cigarettes/Vape Pens

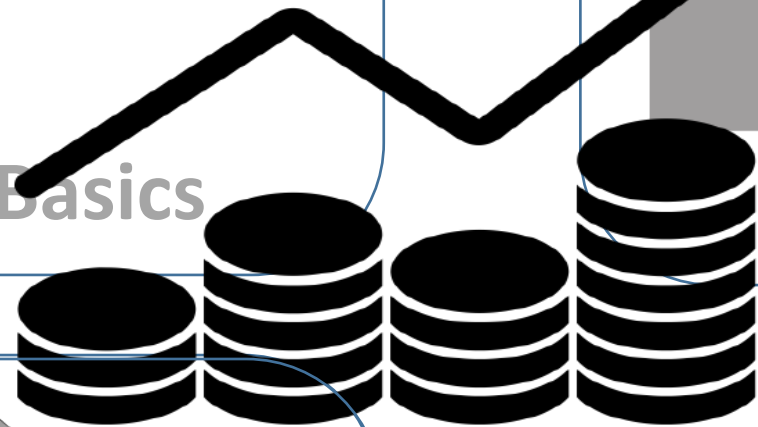




E-Cigarette Basics



Aerosol Contents



Marketing Tactics



Health Risks

# The Usual Suspects



# Who is going to replace the old smokers?



# YOUNG PEOPLE YOUR AGE

**80% of adult smokers started before 18**



# How are e-cigarette and vape manufactures reaching young people?





# Flavors





# Companies Want You NOW



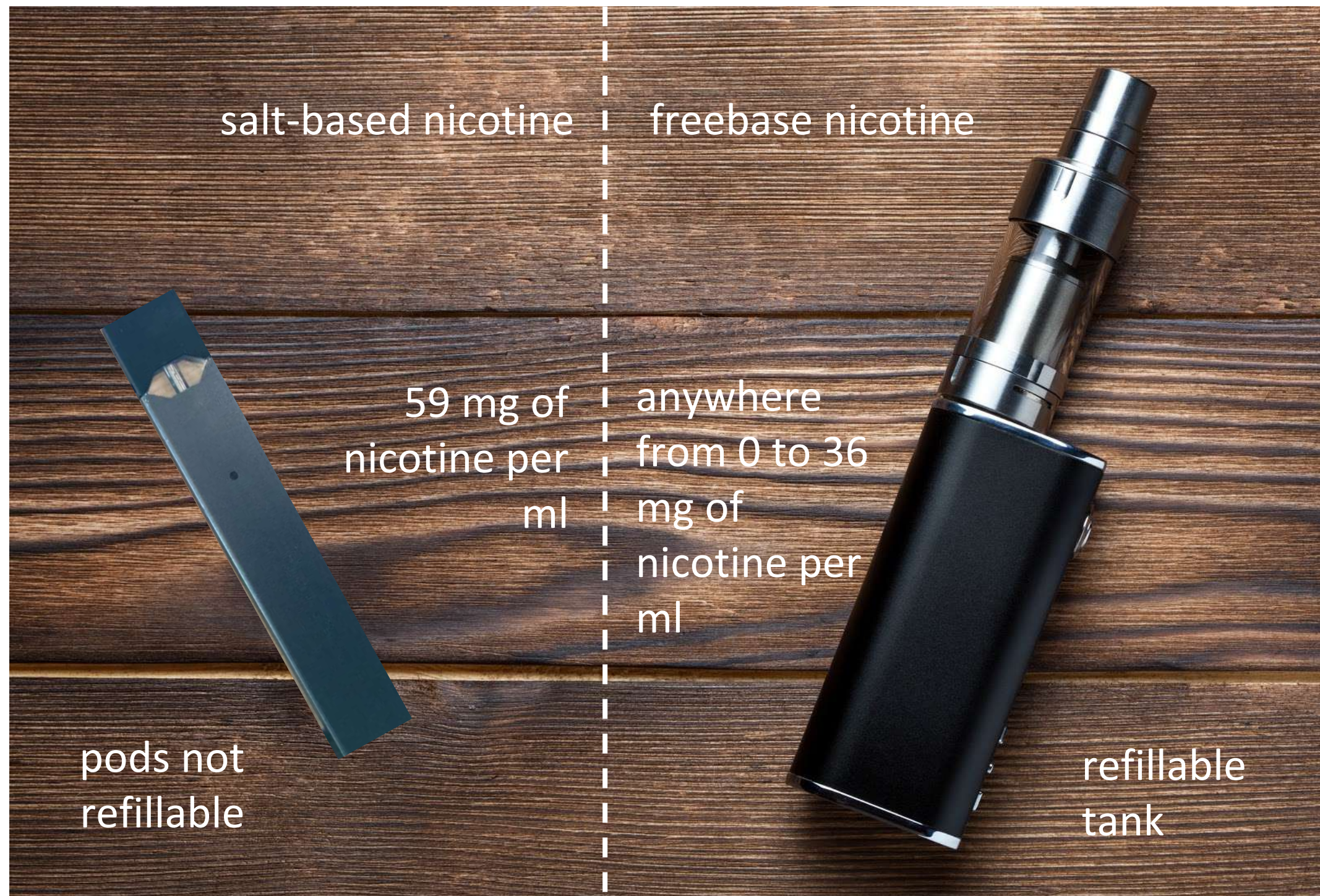


# Targeted Marketing





# Stronger E-Cigarette/Vape





# What's in that JUULpod?

- Nicotine
- Benzoic Acid



20 Million  
devices and pods

TOBACCO

JUUL e-cigs' growth in  
popularity strains supply chain

1 pack of  
cigarettes, in  
nicotine





# DEBRIEFING

[Click Here](#)

