



University of California  
San Francisco

California  
Behavioral Health  
& Wellness Initiative

THE FUTURE LOOKS BRIGHT

# ECHO, Jan 22, 2019

## *ABCs of Tobacco*

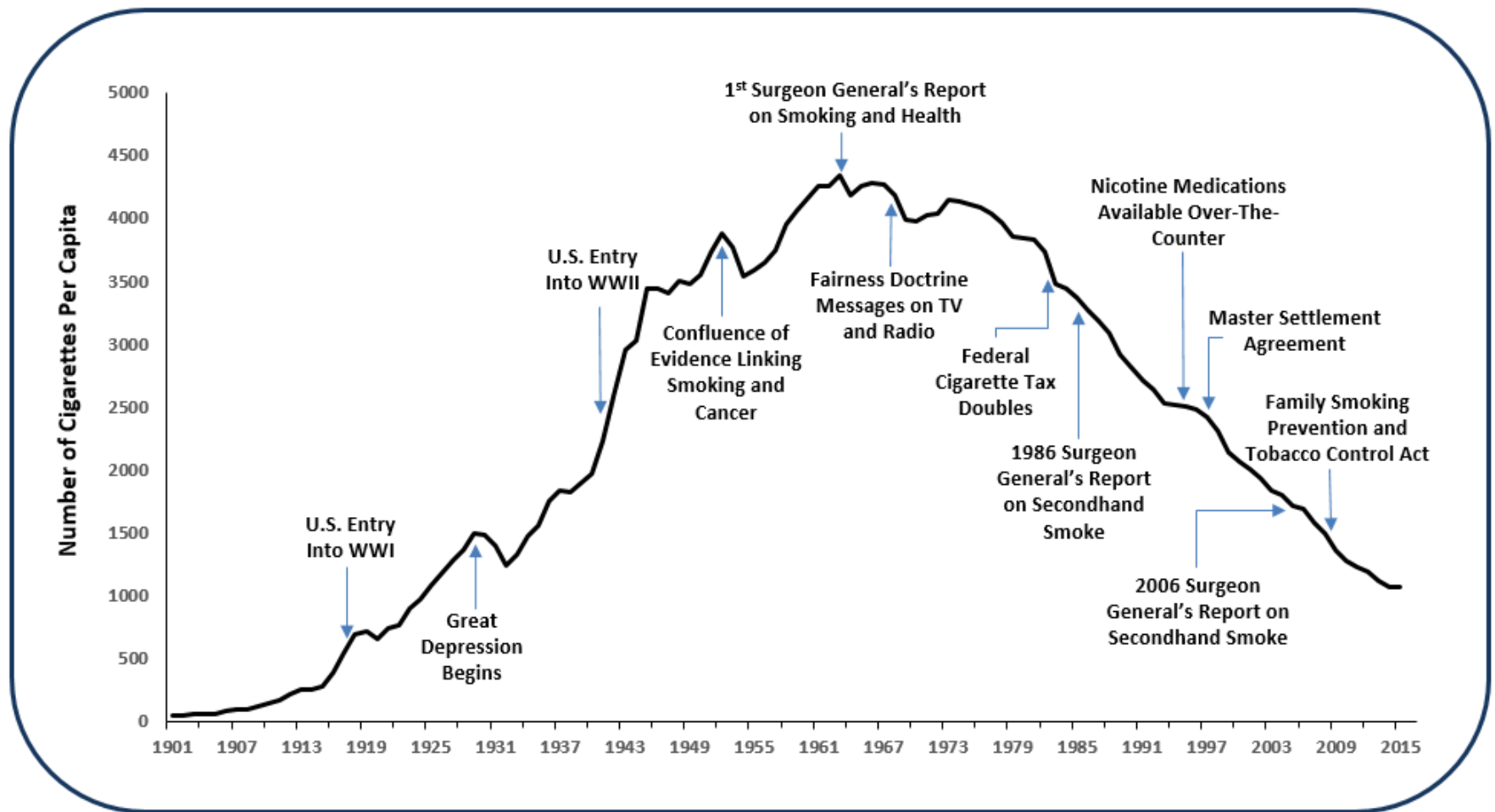
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1/22/2019

# Topics for Today

- Arc of tobacco use in US
- What is in tobacco smoke?
- How does smoking cause harm?
- Nefarious industry practices

# Adult Per Capita Cigarette Consumption and Major Smoking/Health Events—United States, 1900-2015



Sources: Adapted from Warner 1985 with permission from Massachusetts Medical Society, © 1985; U.S. Department of Health and Human Services 1989; Creek et al. 1994; U.S. Department of Agriculture 2000; U.S. Census Bureau 2015; U.S. Department of the Treasury 2015.

# Dopamine Reward Pathway

Prefrontal  
cortex

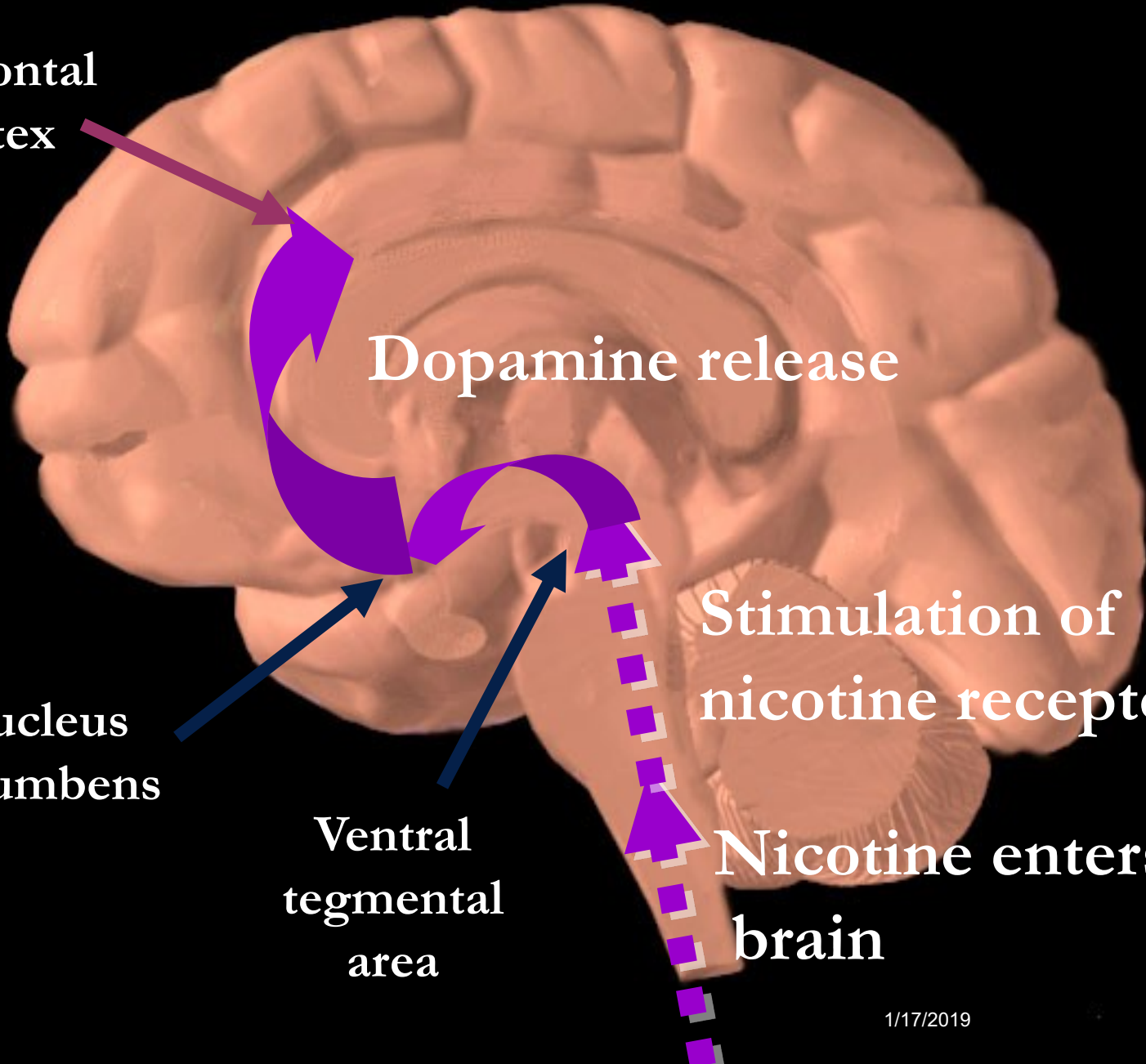
Dopamine release

Nucleus  
accumbens

Ventral  
tegmental  
area

Stimulation of  
nicotine receptors

Nicotine enters  
brain



# Compounds in Tobacco Smoke

An estimated 7,000 compounds in tobacco smoke, including 69 proven human carcinogens

## Gases

- Carbon monoxide
- Hydrogen cyanide
- Ammonia
- Benzene
- Formaldehyde



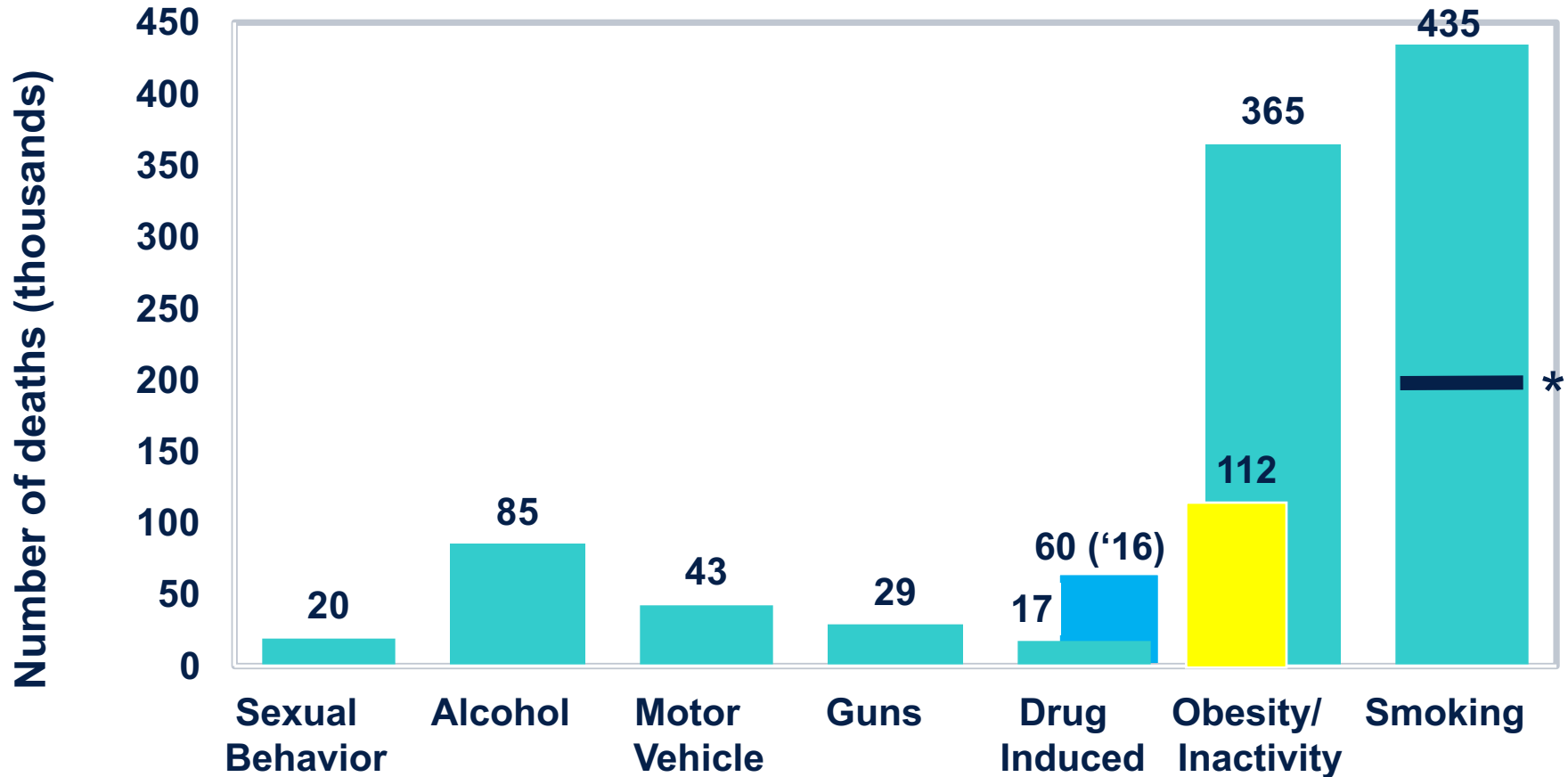
## Particles

- Nicotine
- Nitrosamines
- Lead
- Cadmium
- Polonium-210

# Tobacco's Deadly Toll

- 540,000 deaths in the U.S. each year\*
- 4.8 million deaths world wide each year
  - Current trends show >8 million deaths annually by 2030
- 42,000 deaths in the U.S. due to second-hand smoke exposure
- >16 million in U.S. with smoking related diseases (60% with COPD)
- 34 million smokers in U.S. (76.1% daily smokers, averaging 14.1 cigarettes/day, 2016)

# Behavioral Causes of Annual Deaths in the United States, 2000



Source: Mokdad et al. JAMA 2004;291:1238-1245; Mokdad et al. JAMA. 2005; 293:293  
Flegal KM, Graubard BI, Williamson DF, Gail, MH. Excess deaths associated with  
underweight, overweight, and obesity. JAMA 2005;293:1861-1867

\* Also suffer from mental  
illness and/or substance  
abuse

# Health Consequences of Smoking

## ■ Cancers

- Acute myeloid leukemia
- Bladder and kidney
- Cervical
- Colon, liver, pancreas
- Esophageal
- Gastric
- Laryngeal
- Lung
- Oral cavity and pharyngeal
- **Prostate (↓survival)**

## ■ Pulmonary diseases

- Acute (e.g., pneumonia)
- Chronic (e.g., COPD)
- **Tuberculosis**

## ■ Cardiovascular diseases

- Abdominal aortic aneurysm
- Coronary heart disease
- Cerebro-vascular disease
- Peripheral arterial disease
- **Type 2 diabetes mellitus**

## ■ Reproductive effects

- Reduced fertility in women
- Poor pregnancy outcomes (ectopic pregnancy, congenital anomalies, low birth weight, preterm delivery)
- Infant mortality; **childhood obesity**

- Other effects: cataract; osteoporosis; Crohns; periodontitis;; poor surgical outcomes; **Alzheimers; rheumatoid arthritis; less sleep**



# Causal Associations with Second-hand Smoke

## ■ Developmental

- Low birthweight
- Sudden infant death syndrome (SIDS)
- Pre-term delivery
- **Childhood depression**

## ■ Respiratory

- Asthma induction and exacerbation
- Eye and nasal irritation
- Bronchitis, pneumonia, otitis media, **bruxism in children**
- Decreased hearing in teens

## ■ Carcinogenic

- Lung cancer
- Nasal sinus cancer
- Breast cancer? (younger, premenopausal women)

## ■ Cardiovascular

- Heart disease mortality
- Acute and chronic coronary heart disease morbidity
- Altered vascular properties

**There is no safe level of second-hand smoke.**

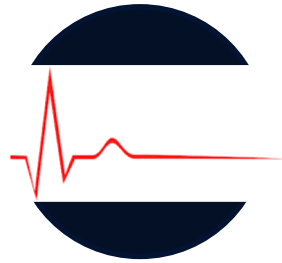
# Adverse Health Effects of Tobacco Use



People with mental illness or substance use disorders die about 5 years earlier than those without these disorders; many of these deaths are caused by smoking cigarettes.



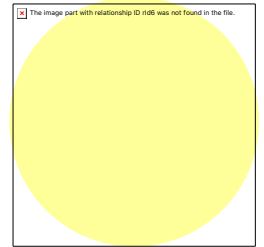
The most common causes of death among people with mental illness are heart disease, cancer, and lung disease, which can all be caused by smoking.



Drug users who smoke cigarettes are four times more likely to die prematurely than those who do not smoke.



Nicotine has mood-altering effects that can temporarily mask the negative symptoms of mental illness, putting people with mental illness at higher risk for cigarette use and nicotine addiction.



Tobacco smoke can interact with and inhibit the effectiveness of certain medications taken by mental health and substance abuse patients.

Sources: CDC. Vital Signs: Current Cigarette Smoking Among Adults Aged  $\geq 18$  Years With Mental Illness—United States, 2009–2011. *MMWR* 2013;62(05):81-87; Druss BG, Zhao L, Von Esenwein S, Morrato EH, Marcus SC. Understanding Excess Mortality in Persons With Mental Illness: 17-Year Follow Up of a Nationally Representative US Survey. *Medical Care* 2011;49(6):599–604; CDC. Vital Signs Fact Sheet: Adult Smoking Focusing on People With Mental Illness, February 2013. NCCDPHP, Office on Smoking and Health, 2013; Smoking Cessation Leadership Center. Fact Sheet: The Tobacco Epidemic Among People With Behavioral Health Disorders. San Francisco: SCLC, University of California, 2015; Smoking Cessation Leadership Center. Fact Sheet: Drug Interactions With Tobacco Smoke. San Francisco: SCLC, University of California, 2015.

# QUITTING: HEALTH BENEFITS

## Time Since Quit Date

Circulation improves,  
walking becomes easier  
Lung function increases  
up to 30%

2 weeks  
to  
3 months

Lung cilia regain normal  
function

Ability to clear lungs of mucus  
increases

Excess risk of CHD  
decreases to half that of a  
continuing smoker

1  
year

Coughing, fatigue, shortness of  
breath decrease

Lung cancer death rate  
drops to half that of a  
continuing smoker

5  
years

Risk of stroke is reduced to that  
of people who have never  
smoked

Risk of cancer of mouth,  
throat, esophagus,  
bladder, kidney, pancreas  
decrease

10  
years

after  
15 years

Risk of CHD is similar to that of  
people who have never smoked

# Never Too Late to Quit\*

<u>Age of quitting smoking</u>	<u>Years of life saved</u>
25-34	10
35-44	9
45-54	8
55-64	4

# Evidence Review\* shows Stopping Smoking Improves BH

- Cochrane Collaborative meta-analysis of 26 papers
- Smoking cessation leads to: ↓ depression, anxiety, stress and ↑ mood and quality of life
- Effect sizes of smoking cessation  $>$  or  $=$  anti-depressive drugs for mood or anxiety disorders
- Among smokers with pre-existing alcohol use disorder, smoking cessation leads to ↓ likelihood of recurrence or continuation of their alcohol use disorder
- Smoking cessation interventions during addictions treatment has been associated with a 25% ↑ likelihood of long-term abstinence from alcohol and illicit drugs

# Smoking and Behavioral Health: The Heavy Burden

- 240,000 annual deaths from smoking occur among patients with CMI and/or substance abuse
- This population consumes 40% of all cigarettes sold in the United States
  - higher prevalence
  - smoke more
  - more likely to smoke down to the butt
- People with SMI die earlier than others, and smoking is a large contributor to that early mortality
- Greater risk for nicotine withdrawal
- Social isolation from smoking compounds the social stigma

# Targeted Marketing

**IT'S A PSYCHOLOGICAL FACT: PLEASURE HELPS YOUR DISPOSITION**



*How's your disposition today?*

**EVER FEEL MEAN AS A MULE?** It's only human, when stubborn annoyances bother you. But remember this psychological fact: pleasure helps your disposition. Everyday pleasures, like smoking for instance, are important. So if you're a smoker, smoke for the most pleasure. That means: smoke Camels!


For more pure pleasure  
—have a  
**Camel**



Today more people smoke Camels than any other cigarette because Camels give them more pure pleasure! So — choose your cigarette for pleasure. Pleasure helps your disposition. And you need only to try Camels to agree: no other cigarette is so rich-tasting, yet so mild as Camel!

**No other cigarette is so rich-tasting, yet so mild!**

## Schizophrenic.

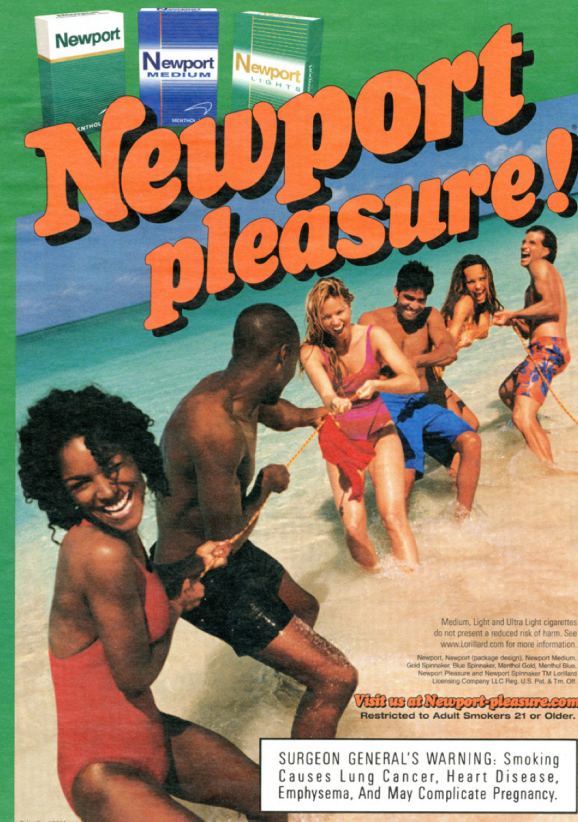


Other low tars are pretty one-dimensional. Dull. But the New Merit is a whole other story: big new taste with lower tar. And that's exciting. In fact, the New Merit has as much taste as cigarettes with up to 57% more tar. Big taste, lower tar, all in one. For New Merit, having two sides is just normal behavior.

**The New Merit. We've got flavor down to a science.**

**SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.**

Source: <http://industrydocuments.library.ucsf.edu/tobacco/docs/txgl0019>



# Newport pleasure!

Medium, Light and Ultra Light cigarettes do not present a reduced risk of harm. See [www.loftland.com](http://www.loftland.com) for more information.

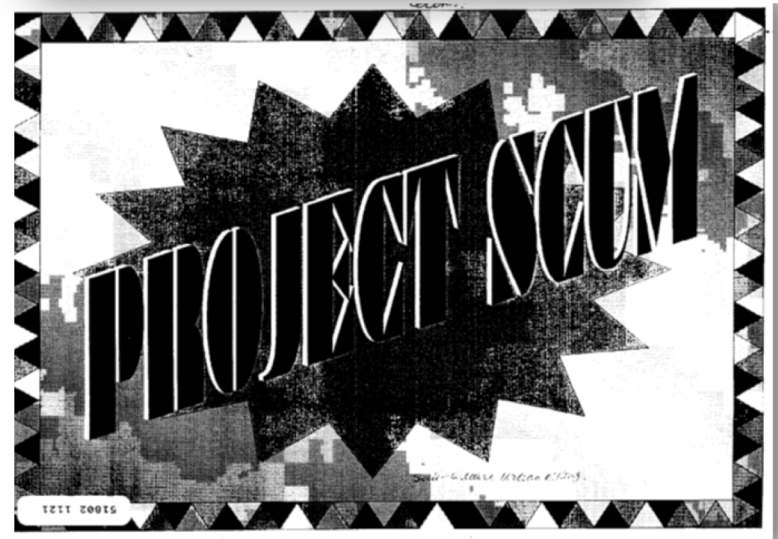
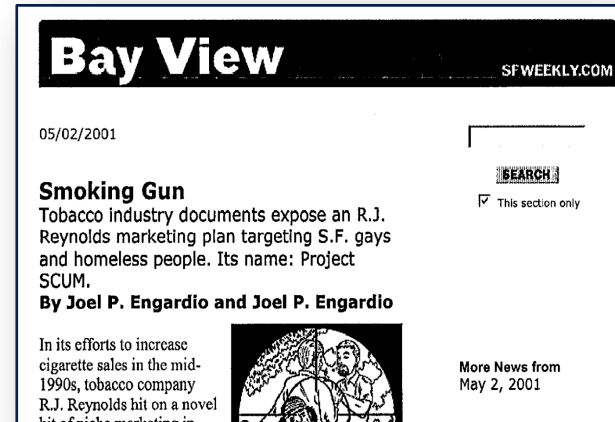
Newport, Newport package design, Newport Merit, Gold Spinnaker, Blue Spinnaker, Merit Gold, Merit Blue, Newport Pleasure and Newport Spinnaker. The Loftland Licensing Company LLC Reg. U.S. Pat. & Tm. Off.

**Visit us at [Newport-pleasure.com](http://Newport-pleasure.com)**  
Restricted to Adult Smokers 21 or Older.

**SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy.**

# Industry Targets BH population

- Pushed Doral to homeless shelters, and psychiatric facilities
- R .J. Reynolds & "consumer subcultures, "(gay/Castro)" and "street people"



Sub Culture Urban Marketing



# Financial Impact

- People with mental illnesses and/or addictions may spend up to **1/3** their income on cigarettes\*
- A pack a day smoker spends on average...
  - \$7.86\*\* per day
  - \$55.02 per week
  - \$220.08 per month
  - \$2,640.96 per year
  - \$26,409.60 per 10 years**



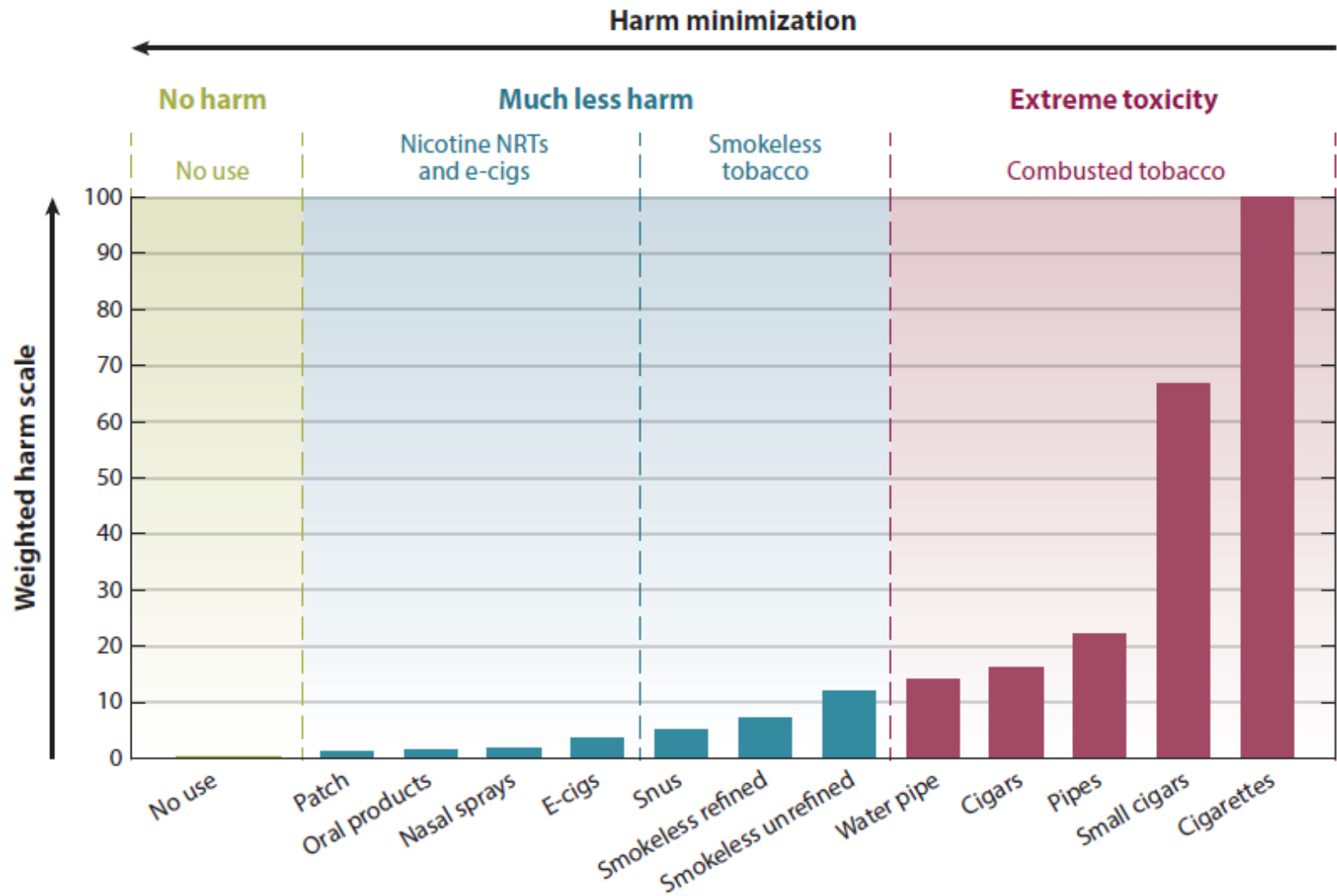
\*Steinberg, 2004

\*\*Average CA price 2018 including taxes (Campaign for Tobacco-Free Kids)

# Tobacco Tipping Point?

- National Adult smoking prevalence at modern low of 13.9% in 2017 (NHIS)
- Youth smoking prevalence at all-time low in 2017 (NYTS):
  - High school: 7.6%; Middle school: 2.1%
- Smokers smoke fewer cigarettes
- Physicians at 1% smoking prevalence
- Lung cancer deaths in women declining
- Increasing stigmatization of smoking

# Relative Harm of Nicotine-containing Products

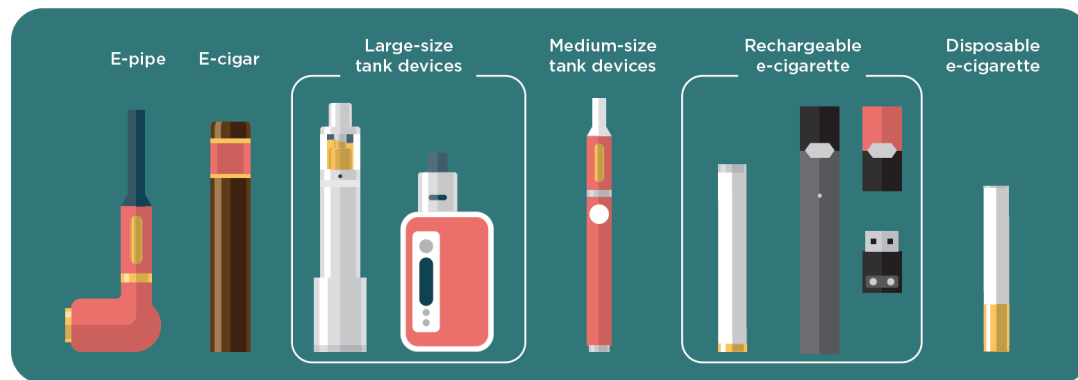


UCSF

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# Types of E-Cigarettes

- E-cigarettes are known by various names, including “e-cigs,” “e-hookahs,” “mods,” “vape pens,” “tank systems,” and “electronic nicotine delivery systems”
- Some e-cigarettes are made to look like regular cigarettes, cigars, or pipes, while others resemble pens, USB sticks, and other items
- E-cigarettes can be used to deliver marijuana and other drugs



# “Heat Not Burn”

- iQOS (Philip Morris) – “I Quit Ordinary Smoking” – uses actual tobacco in the shape of small Marlboro cigarettes that are heated at high temperatures instead of using nicotine-laced liquid
- PMI estimates that 4.7 million adult consumers have stopped smoking and switched to using iQOS (390% increase in global heated product volume)



# ENDS Controversy

## ■ Opponents

- Not completely safe
- Gateway
- Prevents cessation and promotes dual use
- Secondhand vapor exposure
- Renormalizes smoking
- Seductive flavors
- Nicotine and the developing brain

## ■ Advocates

- Less toxic form of nicotine delivery
- Helps with smoking cessation
- More acceptable than other cessation medications
- No evidence for gateway theory
- Modeling exercise in recent NAM report show net public health gain