

# **Tobacco Addiction: A chronic disease**

**Honolulu  
September 18, 2012**

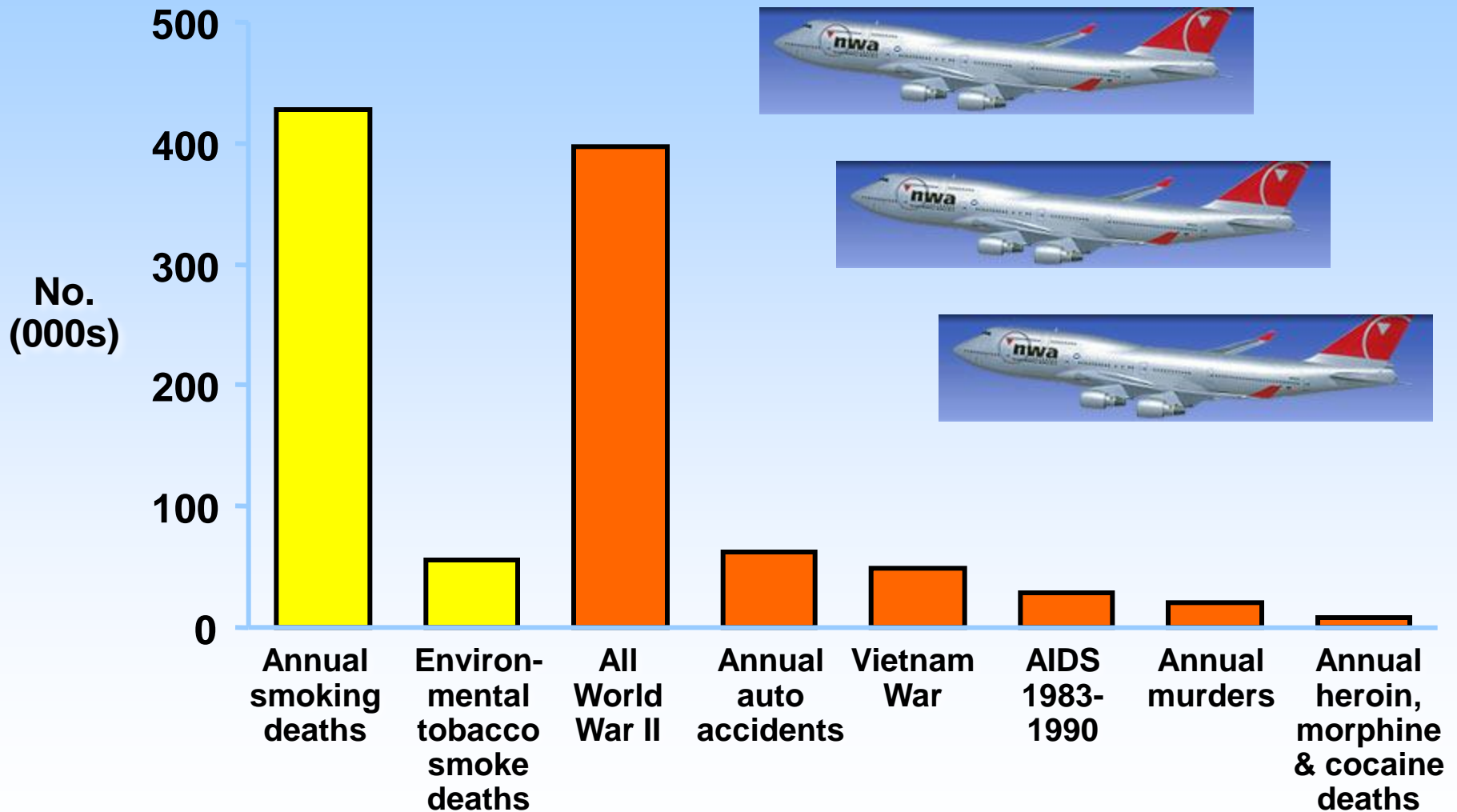
**Michael V. Burke, EdD**

# Overview of the tobacco epidemic

- **Discuss dependence vs. “bad habit”**
- **Identify the physical, psychological and social aspects of tobacco use**
- **Describe the benefits of becoming tobacco free**
- **Describe the effects of second-hand smoke**
- **Explain why switching to smokeless tobacco products is not a safe alternative**
- **Discuss challenges for mental health consumers in stopping tobacco use**

**Everybody knows smoking is bad,  
well how bad is it?**

# The Cigarette Death Epidemic in Perspective



# Overall

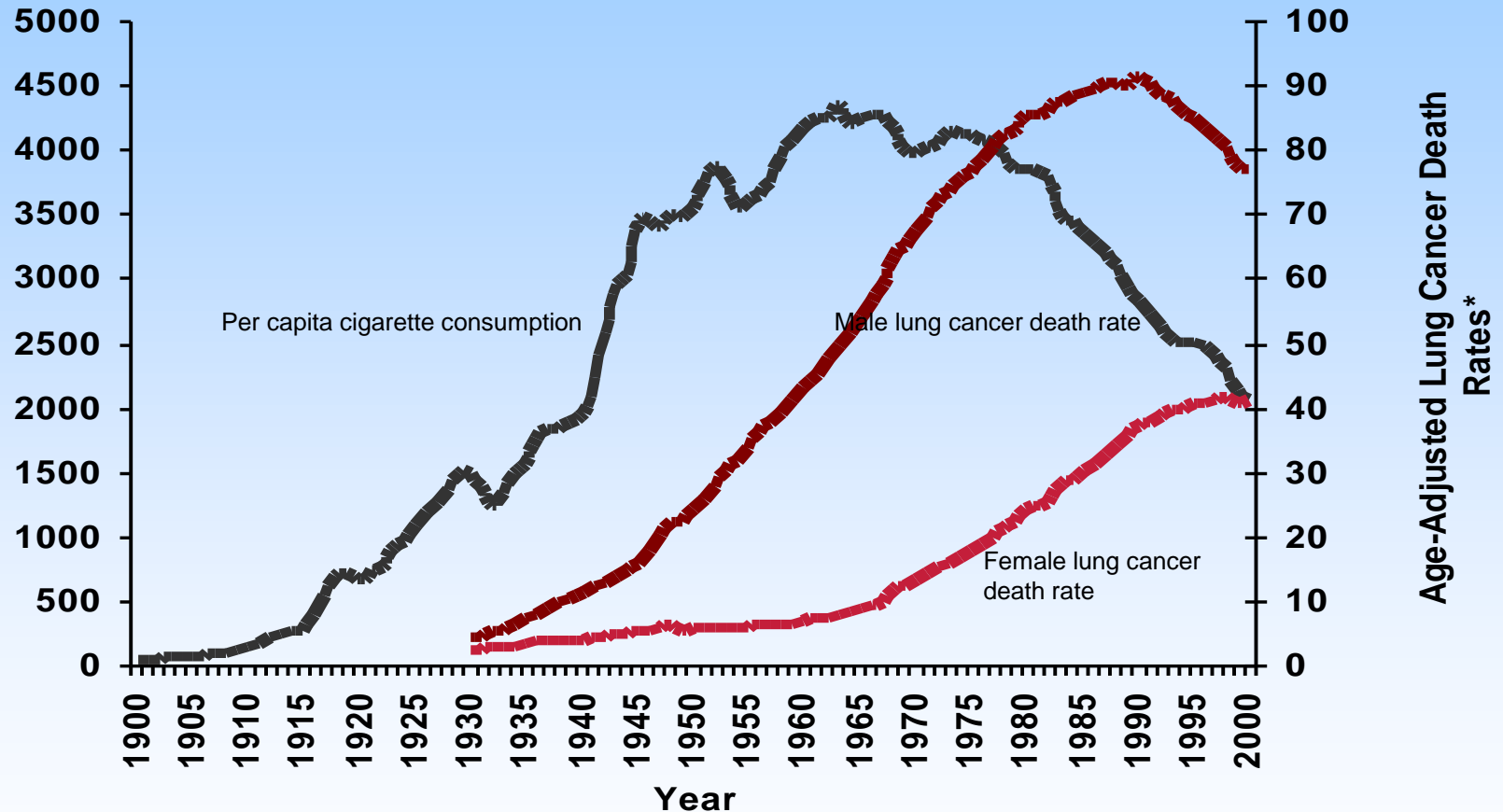
- **Cigarettes cause one in five deaths in US**
- **Chronic illness that in most cases begins in childhood**
  - **Cigarettes kill one in three beginning smokers**
  - **Half of those who don't stop smoking**
- **Effective, but neglected public health responses available**

X = +1.95cm  
Z = +0.00cm  
STND



120 kV  
130 mA  
2.0 sec

# Tobacco Use in the US, 1900-2000

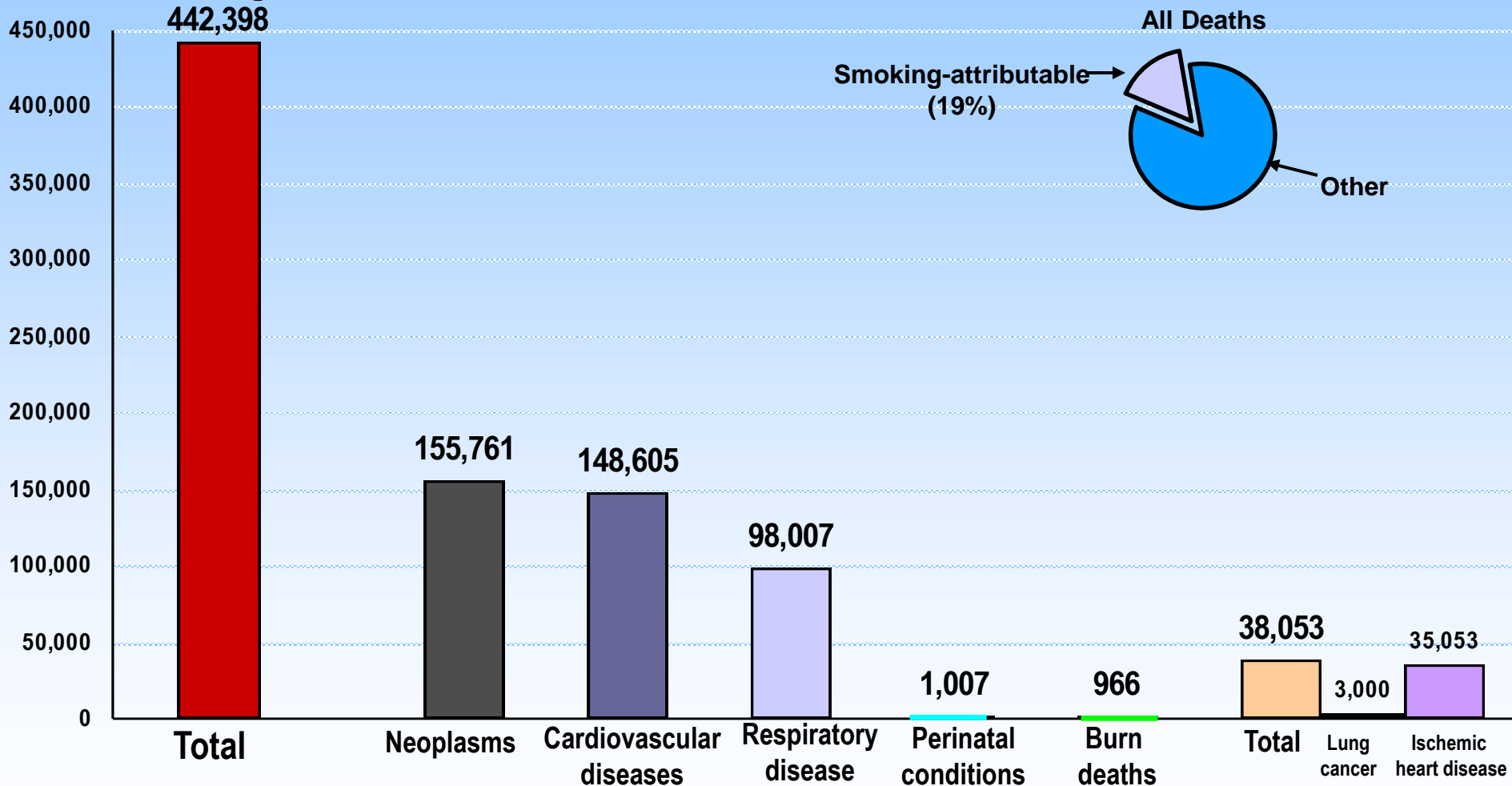


\*Age-adjusted to 2000 US standard population.

Source: Death rates: US Mortality Public Use Tapes, 1960-2000, US Mortality Volumes, 1930-1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2002. Cigarette consumption: US Department of Agriculture, 1900-2000.

# Smoking-Attributable Mortality, 1995-2000

Number of average annual deaths

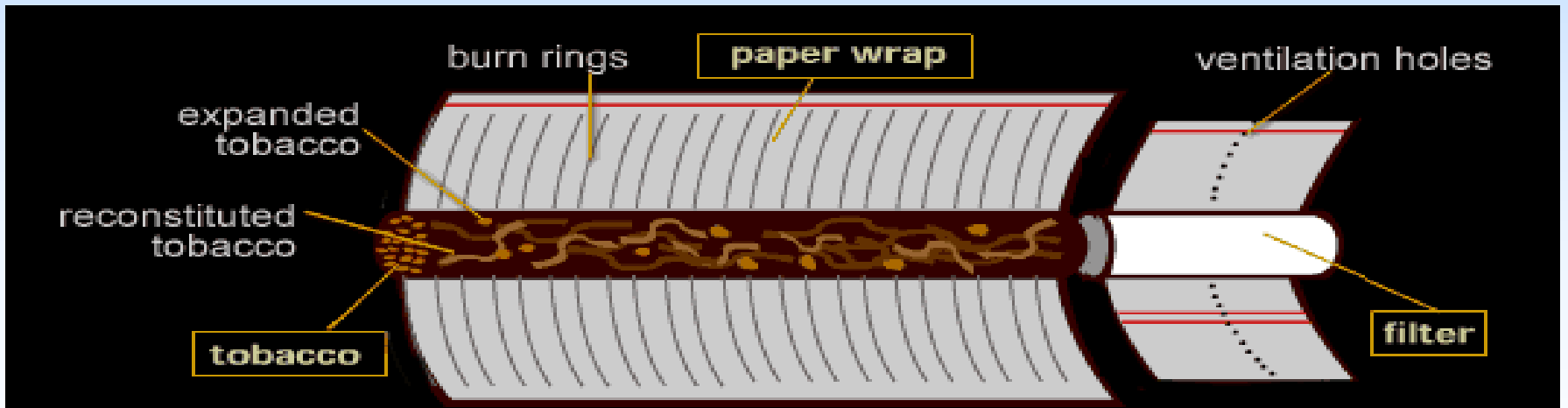


**Environmental Tobacco Smoke**

Sources: CDC. Annual Smoking –Attributable Mortality, Years of Potential Life Lost, and Economic Costs—United States, 1995-1999. MMWR 2002 51;300-3. Burn deaths from: Hall JR. The U.S. smoking-material fire problem. Quincy, Massachusetts: National Fire Protection Association, Fire Analysis and Research Division, 2001. Environmental tobacco smoke deaths from: National Cancer Institute. Health effects of exposure to environmental tobacco smoke: the report of the California Environmental Protection Agency. Smoking and tobacco control monograph 10. Bethesda, Maryland: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, 1999. Total does not equal sum due to rounding.







# **Tobacco smoke: a complex and deadly mixture**

- **7,000 chemicals with over 60 known carcinogens**
- **Carbon monoxide**
- **Vaporized nicotine in free-base form**

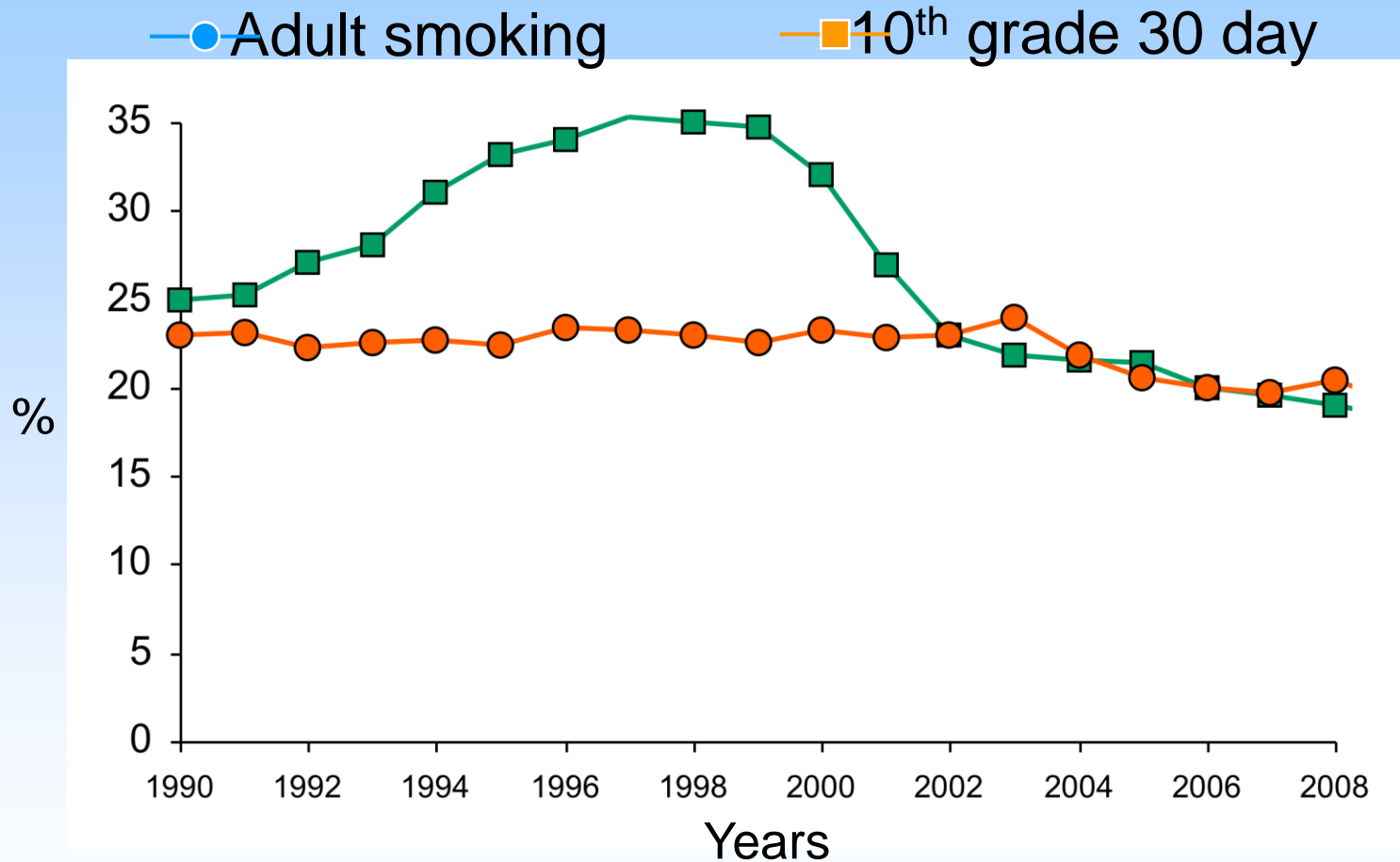
# Tobacco Smoke Constituents

- Arsenic
- Benzene
- Benzo[a]pyrene
- Cadmium
- Chromium VI
- Cresol
- Formaldehyde
- Lead
- Nitrosamines
- Phenol
- Polonium 210
- Polycyclic aromatic hydrocarbons
- Vinyl chloride

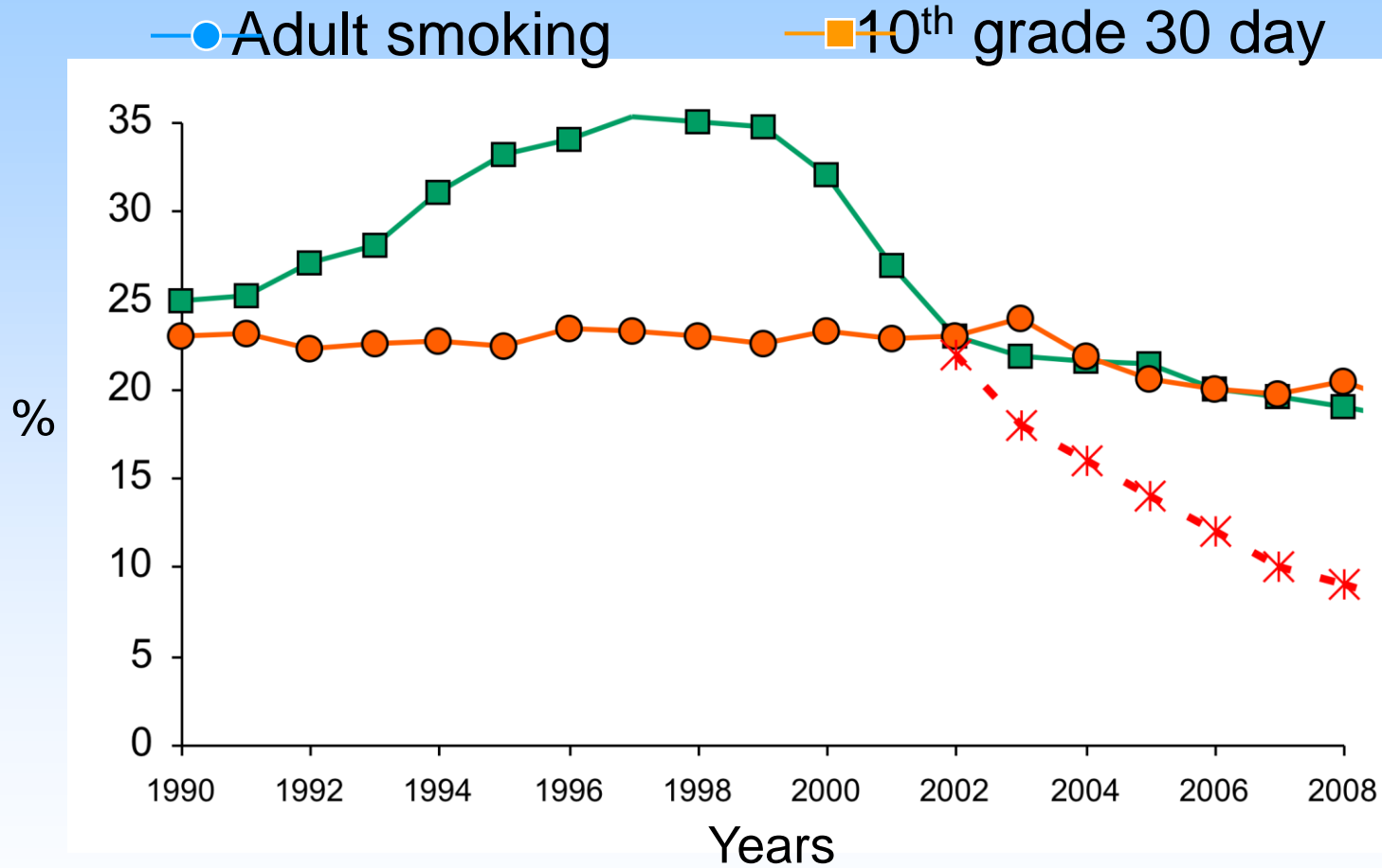
# Addiction to tobacco

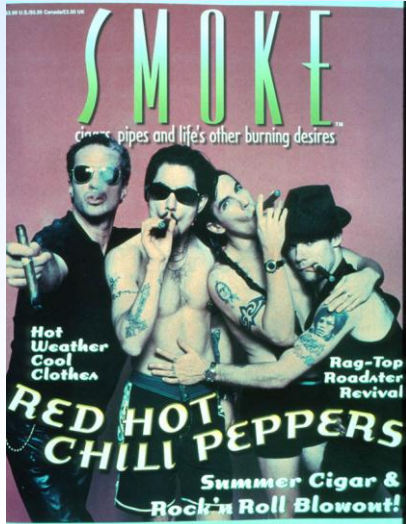
- **Tobacco addiction has been labeled a “pediatric epidemic” by former FDA director Dr. David Kessler, because most adults who struggle with nicotine dependence became dependent on the drug as children.**

# Tenth grade smoking prevalence compared with adult smoking prevalence



# If progress had continued – 3 million fewer smokers





# Habit or Addiction

## Discussion



# **An addictive illness**

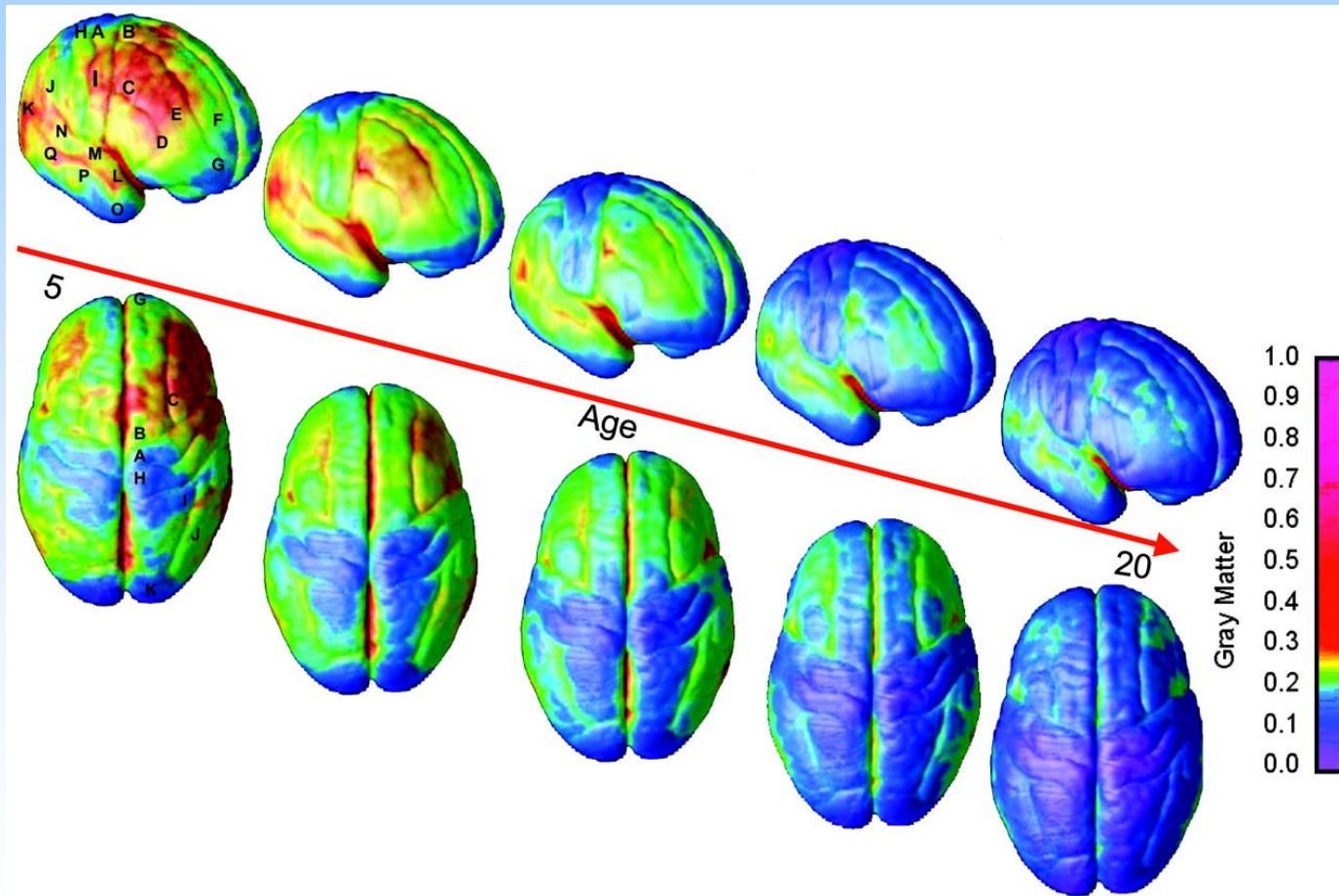
- **Nicotine dependence begins in childhood and adolescence**
- **No one plans to become addicted**
- **Person feels in control until control has already been lost**
- **A gradual process – a seduction**



How long does it take for a child to become addicted?

As few as two cigarettes per week

# Gray Matter Maturation

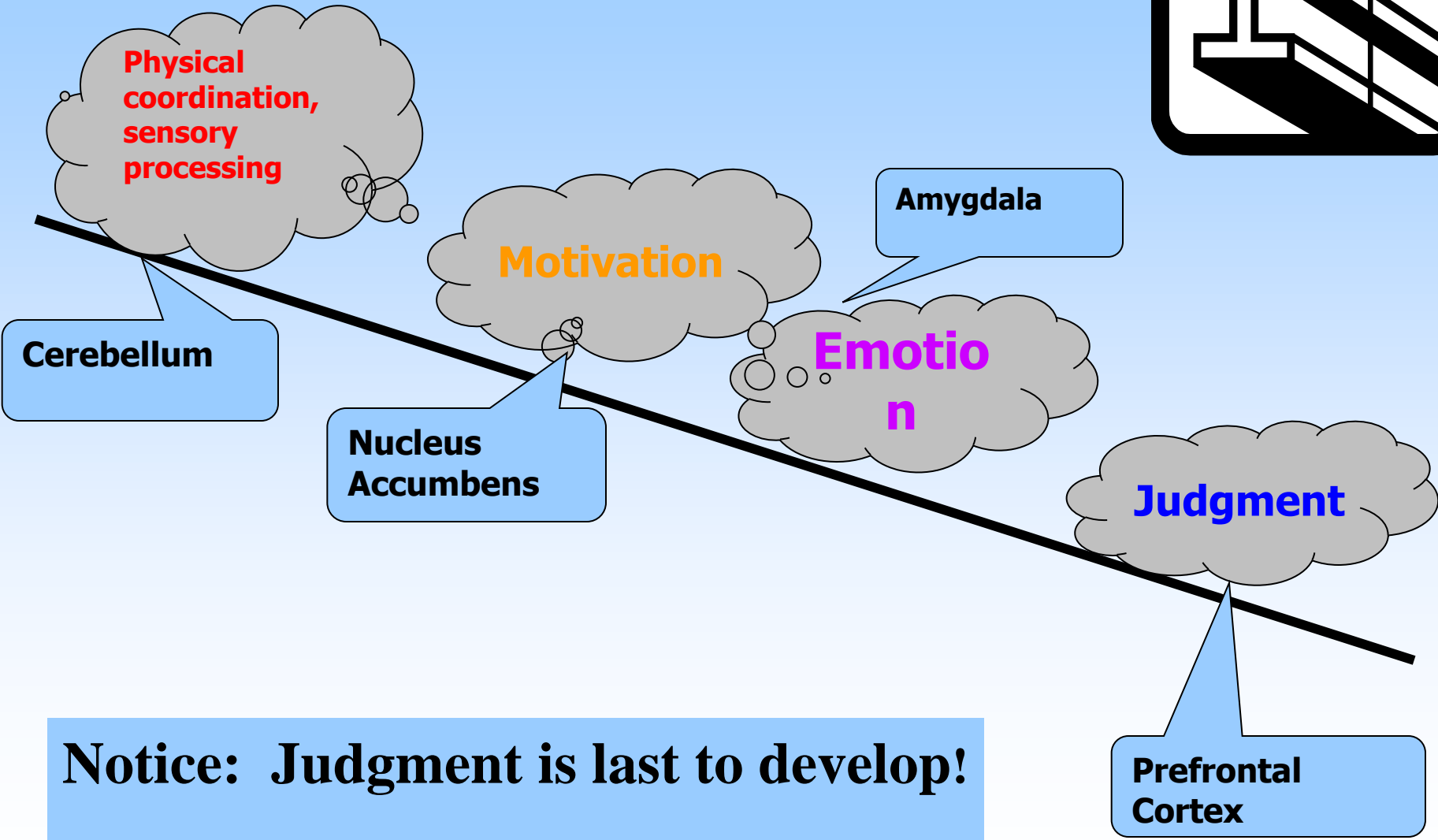
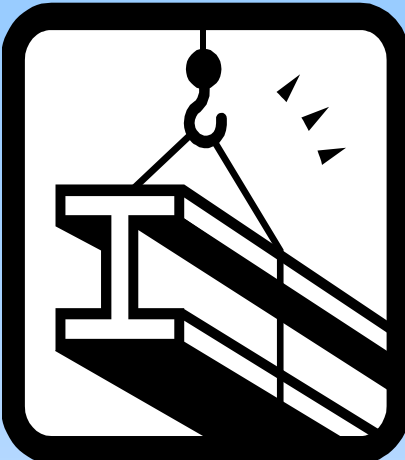


Source Gogtay, Niten et. Al. (Proc. Natl. Acad Sci. 101, 8174-8179

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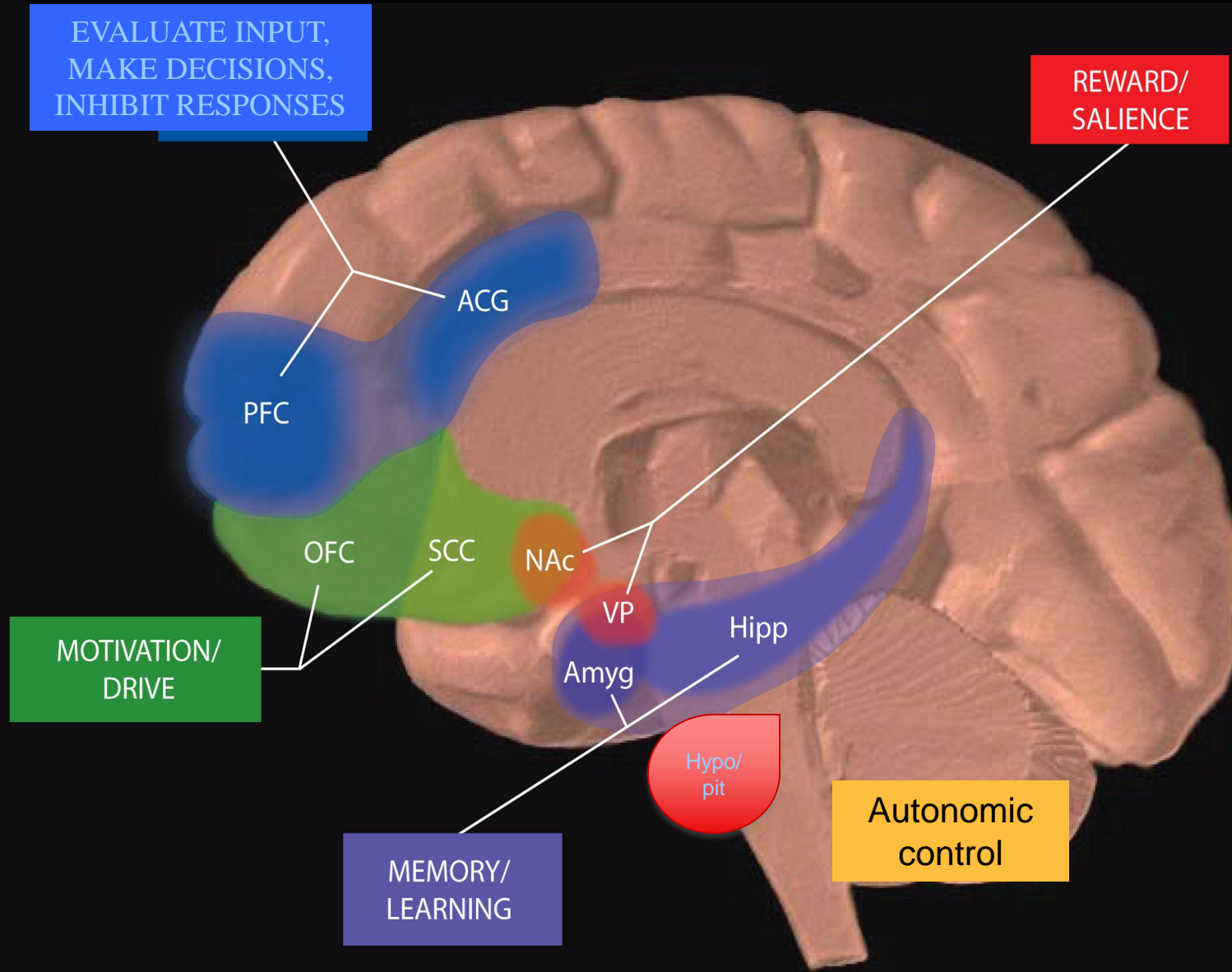
# Maturation starts at the back of the brain ... and moves to the front



**Notice: Judgment is last to develop!**



# The Brain



# CHANGING AN ADDICITON IS HARD

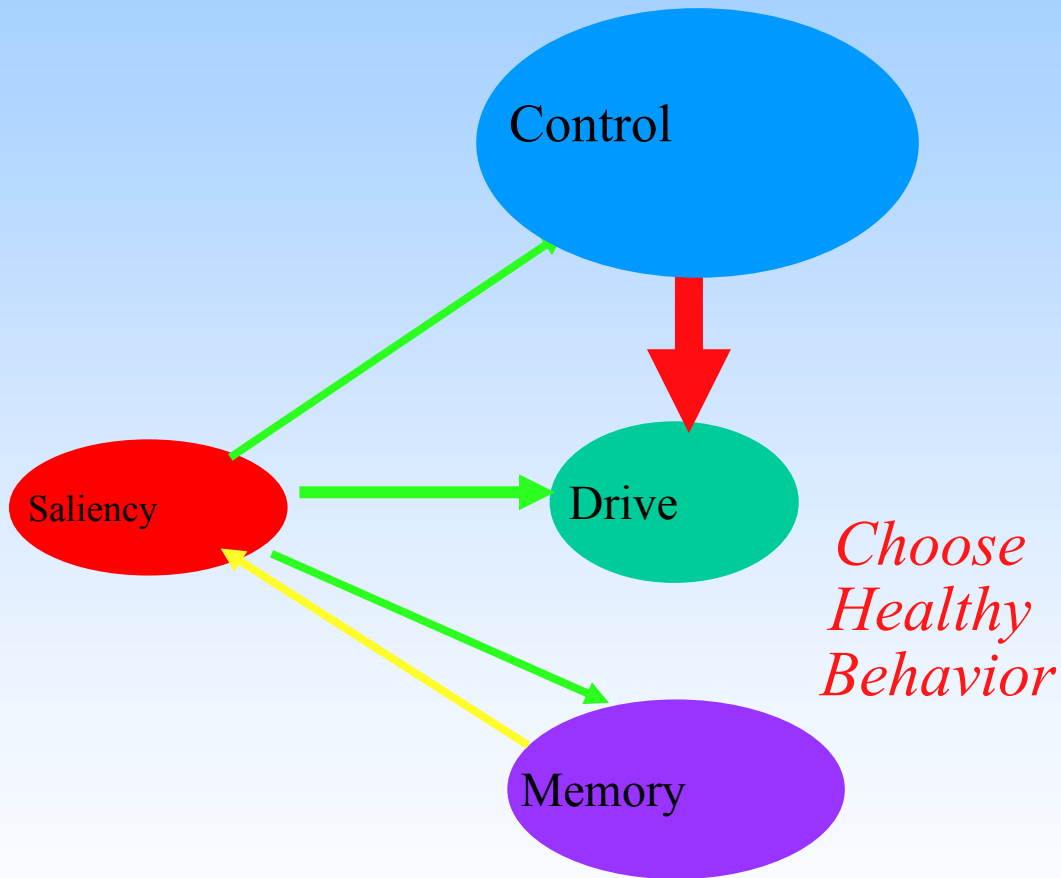






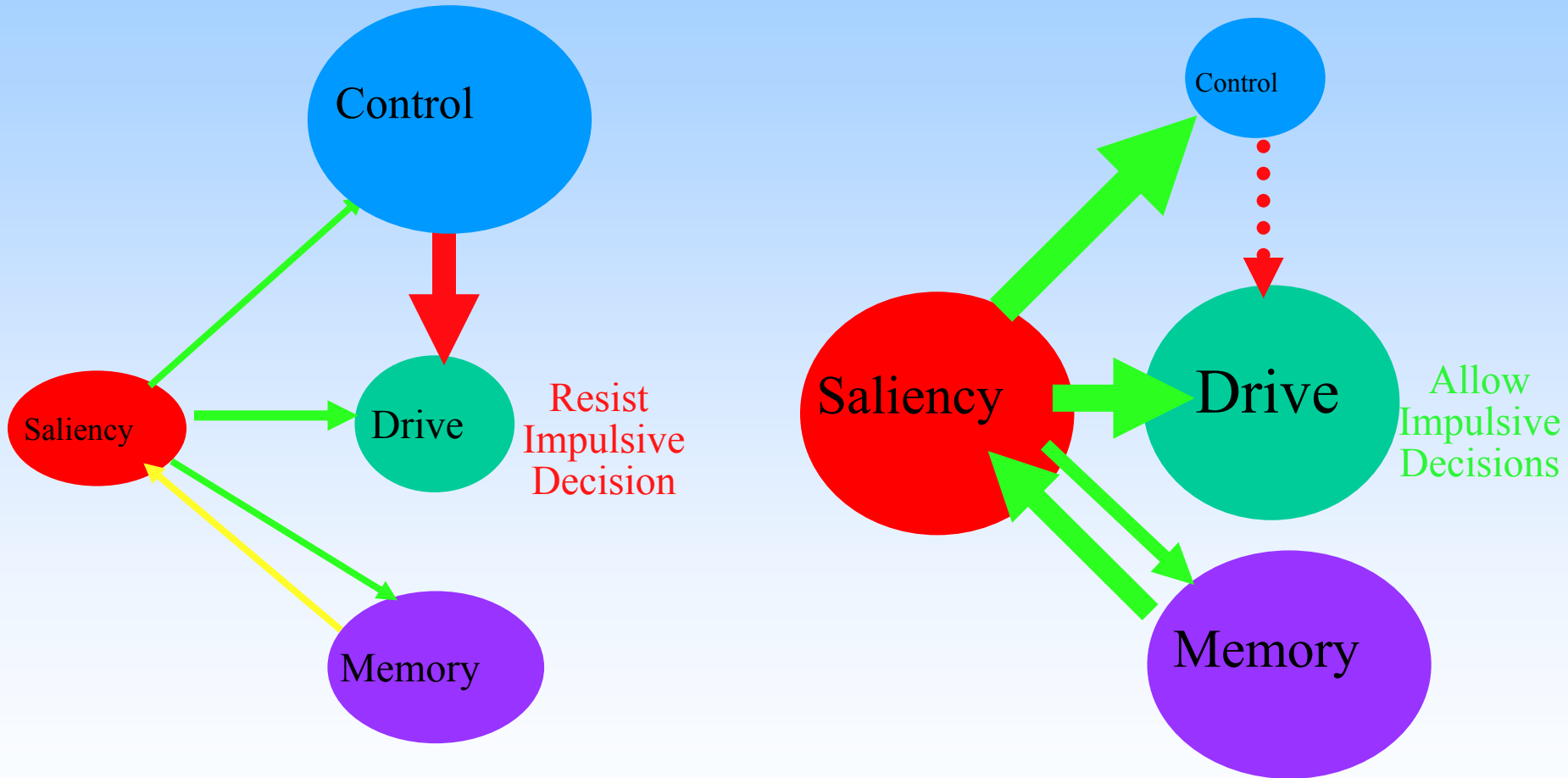


# Self regulation

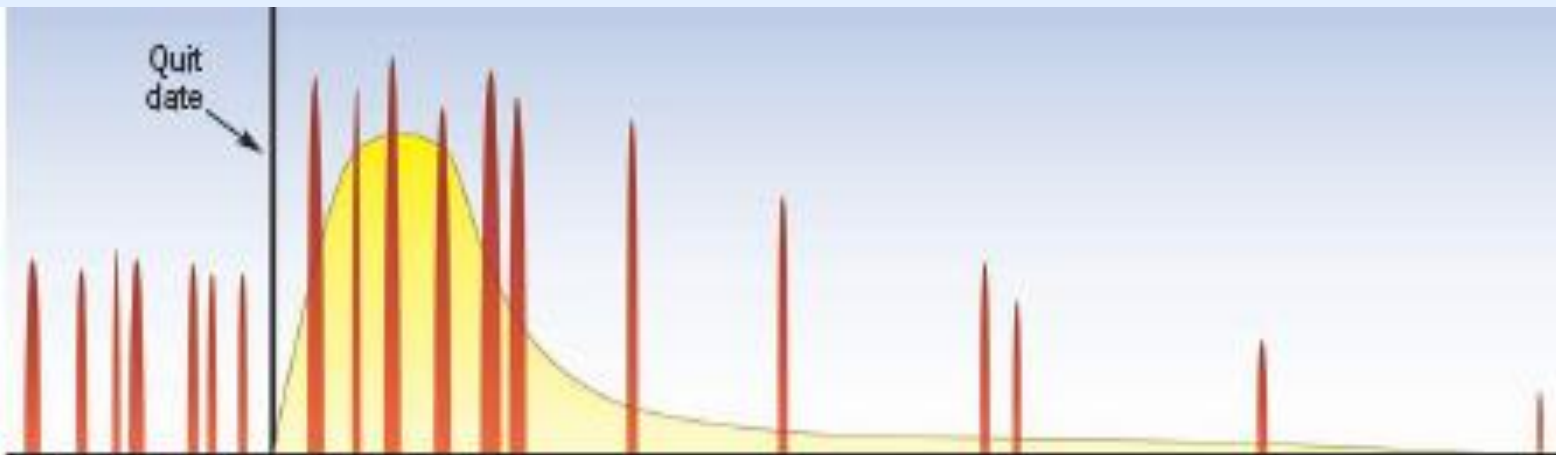
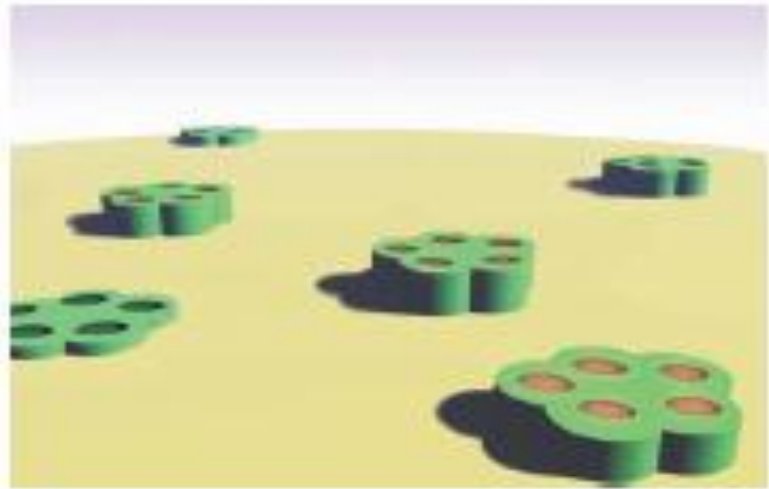


Source: Adapted from Volkow et al., *Neuropharmacology*, 2004.

# Tired Brain Circuits



Source: Adapted from Volkow et al., *Neuropharmacology*, 2004.



# Why are cigarettes so addicting?







# THE PRINCIPAL HERO

Heimlich maneuver saves choking girl

SEE PAGE 5

# DAILY NEWS

NEW YORK CITY NEWSPAPER Tuesday, March 18, 1998



## DO THE RIGHT THING'

Slain cop's partner pleads for killer's execution in emotional eulogy

SEE PAGES 6 & 7

# SMOKE GETS IN THEIR LIES

FULL REPORT ON PAGE 2

Cig industry reels as former employe claims bosses covered up nicotine data

*"I believe that cigarettes are not addictive."*

The important question is whether the harmful aspects, either real or imaginary, will seriously weigh in the public estimation against the benefits. The force of the psychological effects in maintaining smoking are liable to be over-estimated; they are strong if smoking is accepted as a good practice but they are unlikely to be able long to hold the position if smoking were to be condemned on physiological grounds. The important support for smoking comes from the stimulation of the body's stress-resisting mechanisms which, under modern conditions of life, is an essential function. If the absorption of nicotine is made pleasant and attractive this enhances the benefit just as in the case of well prepared and well served food. However, the force of the habit or the strength of addiction is not such as to give any grounds for complacency in the face of alternative methods of stimulating the body to meet stress, and that is just where the danger lies since alternative methods are becoming available. In the last few years there has been a quite remarkable increase in the production of tranquilliser drugs, and while most of these need a doctor's prescription there is already one on free sale in Switzerland [Librium made by Hoffmann La Roche]. If such drugs become more freely available they will compete with nicotine, which is a natural tranquilliser, and will leave smoking primarily dependent on its psychological effects for the maintenance of the habit.

**What we need to know above all things is what constitutes the hold of smoking, that is, to understand addiction.**

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of the cortico steroids in the blood. This is important information on the mechanism of what has so long been known in a general way that nicotine stimulates the body to resist stress. However, this is only the first step since, as is usual in physiological control mechanisms, the amounts of the agents in these various stages are each controlled by a balance between two separate processes, one stimulating production and one inhibiting production. A priori, the increased amounts of cortico steroids resulting from nicotine could be due either to an increase of stimulation or a decrease of inhibition. Attempts to probe this uncertainty are being made by experiments on rats which have had different parts of their brains lesioned.

These experiments are encouraging since they are beginning to elucidate what may be termed the basic effect of nicotine, but it is important to note that this cannot be responsible for addiction because it all occurs in too short a time. The stimulation to resist stress occurs almost immediately on absorption of nicotine, and the effect - that is, the extra supply of cortico steroids in the blood - falls off markedly within a matter of thirty minutes. Addiction is something quite different from this since it is well known that the craving for nicotine in a confirmed smoker who stops smoking persists for ten, twenty or thirty days.

**We believe that we have found possible Experiments have so far only been carried out with rats, but with these it is found that certain rats become tolerant to repeated doses and after a while show the usual nicotine reactions but only on a very diminished scale.**

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SECTION III.

RESEARCH PROPOSAL FOR PROJECT HIPPO II.

The work proposed should give an objective comparison between the mode of action of nicotine and the tranquillising drugs. It should also lead to an understanding of the mechanism which creates addiction. It is planned to organise the research under two heads - physiological and biochemical.

The physiological part will involve the use of rats and rabbits, and will compare the effects of nicotine and reserpine [a standard tranquilliser] on certain specific substances in the blood which, on current knowledge, are involved in tranquillising action. Supposing the tranquillising action of

**Subsequently similar measurements will be made on human non-smokers and on addicted smokers.**

liver fractions from rats and rabbits both in the case of fresh animals and those who had become accustomed to regular nicotine treatment. The aim would be to test the hypothesis, mentioned in Section II, that addiction depended on the enzymes involved in the metabolism of nicotine in the liver.

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Basically then the action is to prevent tobacco being

**There seems no doubt that the “kick” of a cigarette is due to the concentration of nicotine in the blood-stream and this is a product of the Nicotine is in the smoke in two forms as free nicotine base (think of ammonia) and as a nicotine salt (think of ammonium chloride) and it is almost certain that the free nicotine base is absorbed faster into the blood-stream.**

HDA/MDP/46C  
7. 8. 64.

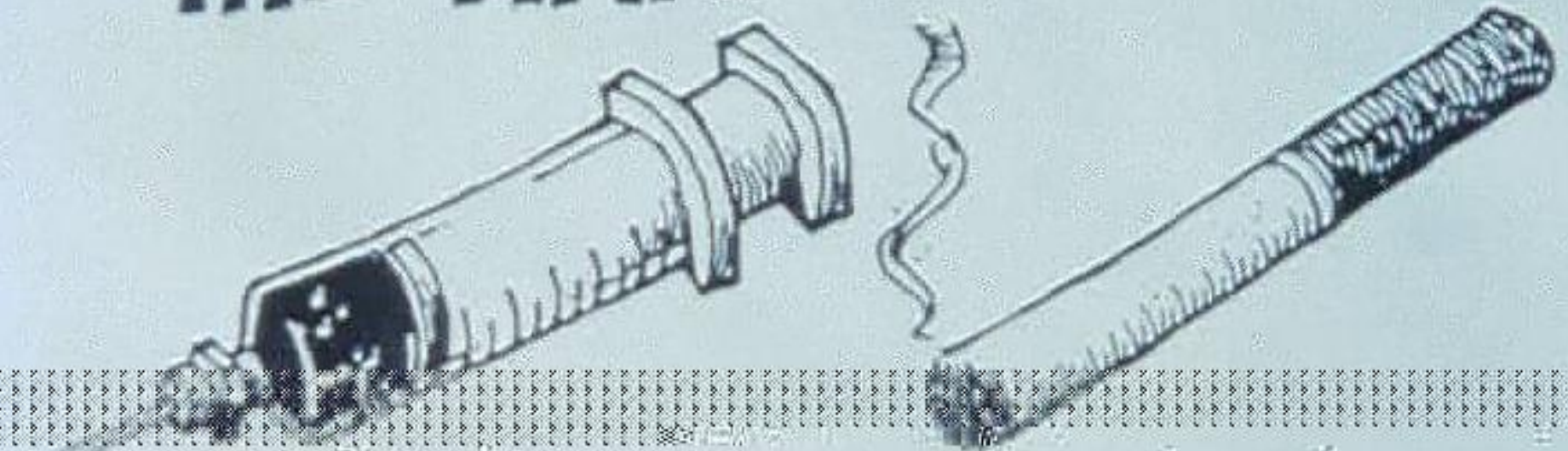
c. c. R. and D. E. ✓

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# THE WAR ON DRUGS



DESTROY THE CROPS,  
EXECUTE THE PUSHERS  
AND REHABILITATE  
THE USERS.

SUBSIDIZE THE CROPS,  
EXONERATE THE PUSHERS  
AND BLAME  
THE USERS.





NEW  
DORAL

SKOAL  
BANDITS

The little pouch of tobacco  
pleasure.

CHARMS  
BLOW  
POP

ELITE  
DIAMOND

smokehouse

So Real! So Nice!  
Fur Mice

CHARMS  
BLOW POP

ALMONDS

MERIT

Marlboro

Marlboro

DORAL

DORAL

DORAL

2 20

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**TURKISH GOLD**

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**7 PLEASURES OF THE CASBAH**

**SEE INSIDE FOR DETAILS!**



Am I worth it?

40 years of reducing smoking rates

**EXCEPT** for smokers with mental illness or addiction

# The stigma

- **People with serious mental illness die 25 years earlier than general population**
- **Nicotine dependence is documented in only 2% of the medical records in mh/sa programs**
- **People treated for alcoholism more frequently die from tobacco dependence**
  - Hurt, 1996

# **This is a health disparity issue**

- **People with MH and SA diagnoses are consuming tobacco 2-3x the rate of the rest of the population**
- **The system in which they receive care currently does little to change tobacco use**
- **The behavioral health system needs large systemic changes to address this problem**
- **Tobacco control has to date largely ignored this issue**

# Why the stigma?

- **Assumptions:**
  - they don't really want to quit
  - they are not able to quit
  - if they don't have tobacco they will act out
  - Assumption: their addiction or mental health problems will worsen if they give up tobacco

# Barriers to Addressing Smoking

- **Provider Resistance**
- **Patient Resistance**
- **Family Resistance**
  - **Taking away their only pleasure**
- **Concern about interaction with psych meds**
- **Easy Access**



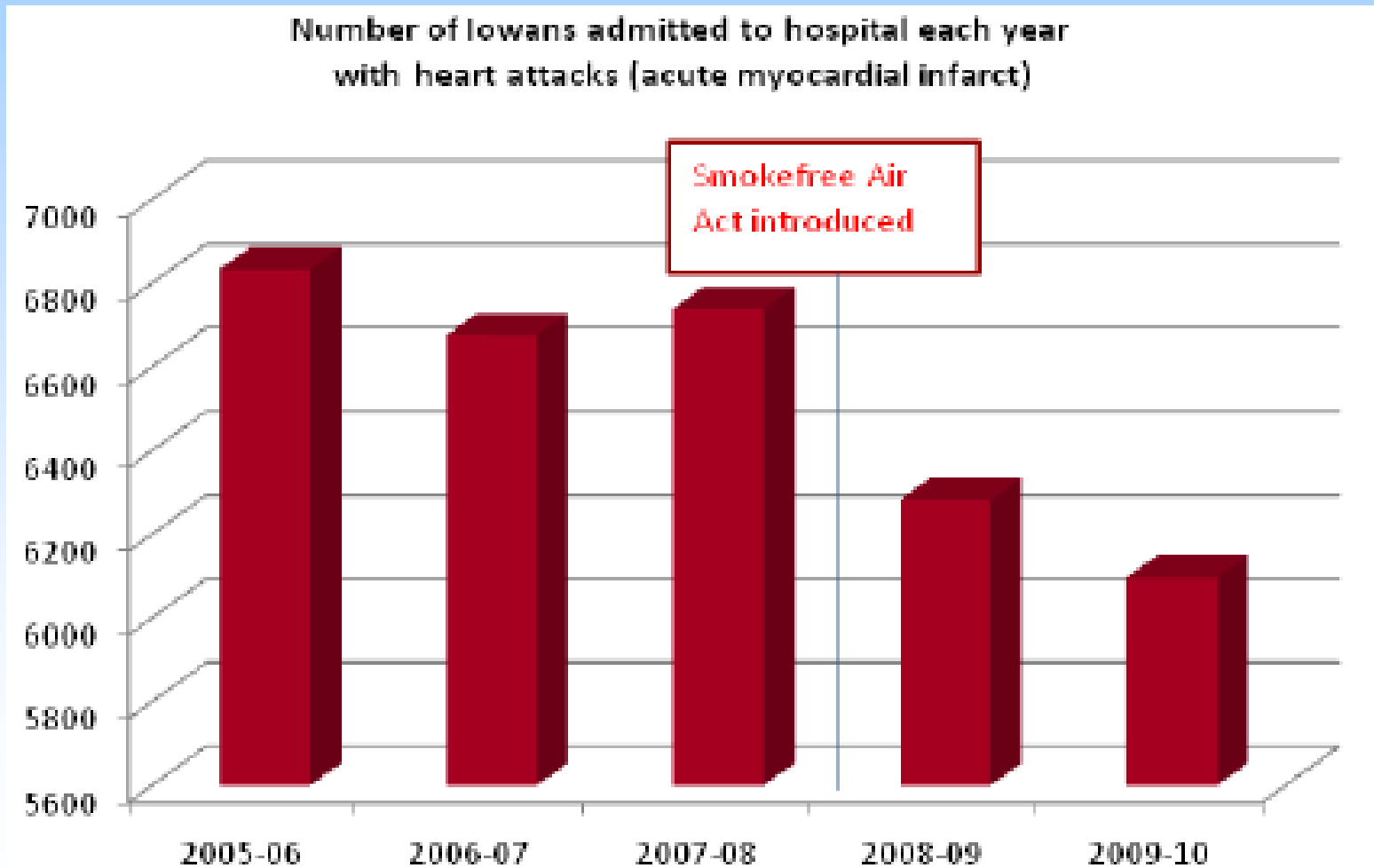
# **It takes a village**

- **Maintain smoke free environments**
- **Help people stop smoking**
- **Advertising restrictions and cost increases**
- **Provide accurate and comprehensive education**

# Tobacco Smoke Constituents

- Arsenic
- Benzene
- Benzo[a]pyrene
- Cadmium
- Chromium VI
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- Polonium 210
- Polycyclic aromatic hydrocarbons
- Vinyl chloride

# Since smoke free ordinance heart attacks dropped 8%

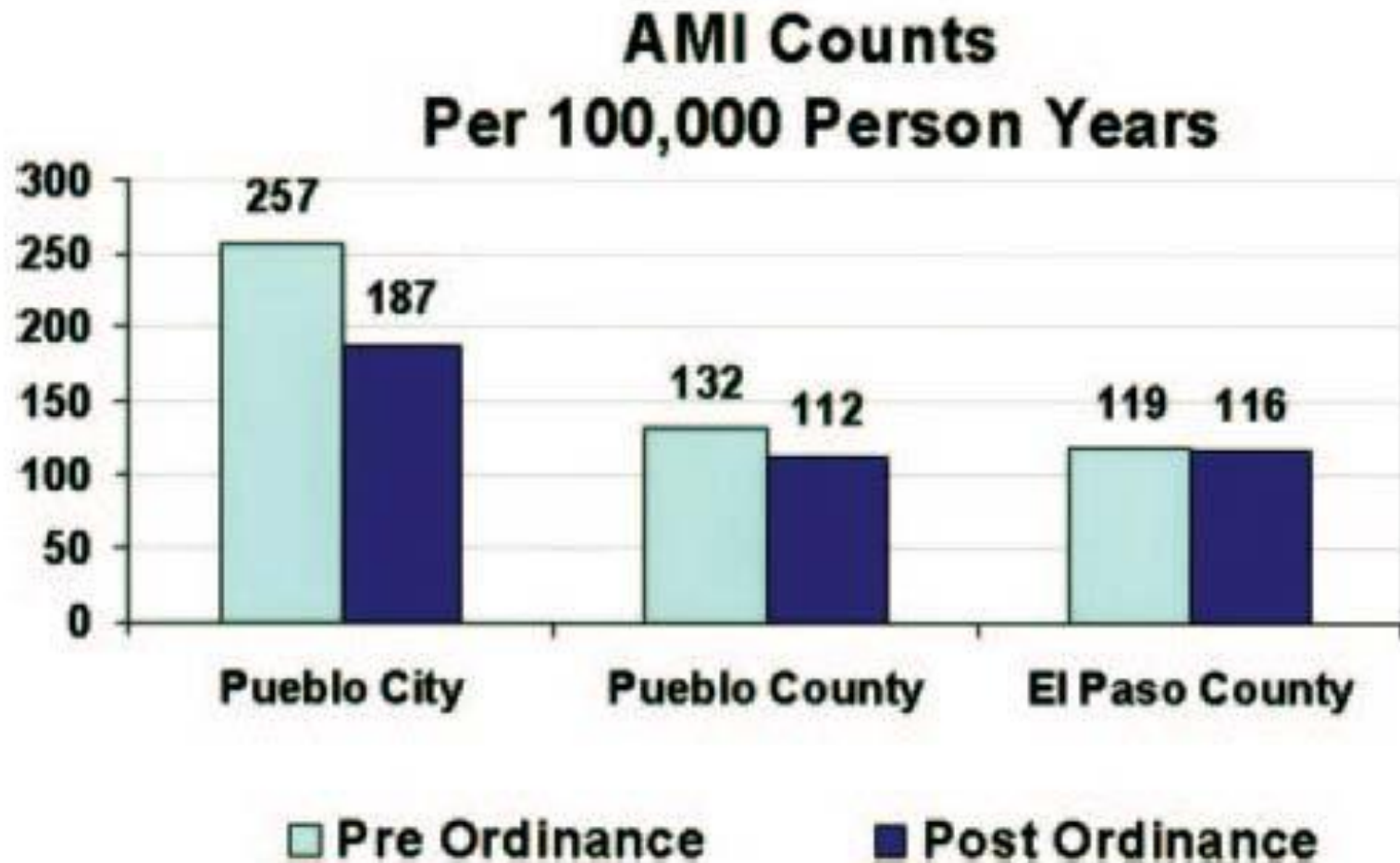


# Smoke-Free Ordinances and Heart Attacks

- **Helena, MT: Monthly admissions for AMI  
40 → 16**
  - **Sargent, RP. BMJ 328:977, 2004.**
- **Pueblo & El Paso, CO: Admissions for AMI  
Pueblo 257 → 187 (per 100,000)  
vs. El Paso 119 → 116.**
  - **Bartecchi, C. Circulation 114:1490, 2006.**
- **Piedmont Region, Italy: Admissions for AMI  
11% 922 → 832**
  - **Barone-Adesi, F. Eur Heart J 27:2468, 2006.**
- **Bowling Green & Kent, OH: Admissions for  
CHD  
Down 47% 3 years after ordinance.**

**Khuder, SA. Prev Med 45:3,2007.**

# AMI Counts Per 100,000 Person Years



**Bartecchi, C. Circulation. 114:1490, 2006.**

# “The Debate is Over”

## *The Health Consequences of Involuntary Exposure to Tobacco Smoke*

### The Health Consequences of Involuntary Exposure to Tobacco Smoke

A Report of the Surgeon General



Department of Health and Human Services



**Surgeon General Richard H. Carmona**  
June 27, 2006

# 2006 U.S. Surgeon General Report

## Cigarette Company Response

**Philip Morris-** “We are studying the report.”

**R.J. Reynolds-** “.....does not change our views about secondhand smoke.”

“There are still legitimate scientific questions concerning the reported risks of secondhand smoke.”

“People who don’t want to work around it don’t have to work at that establishment.”

# Treatment Works

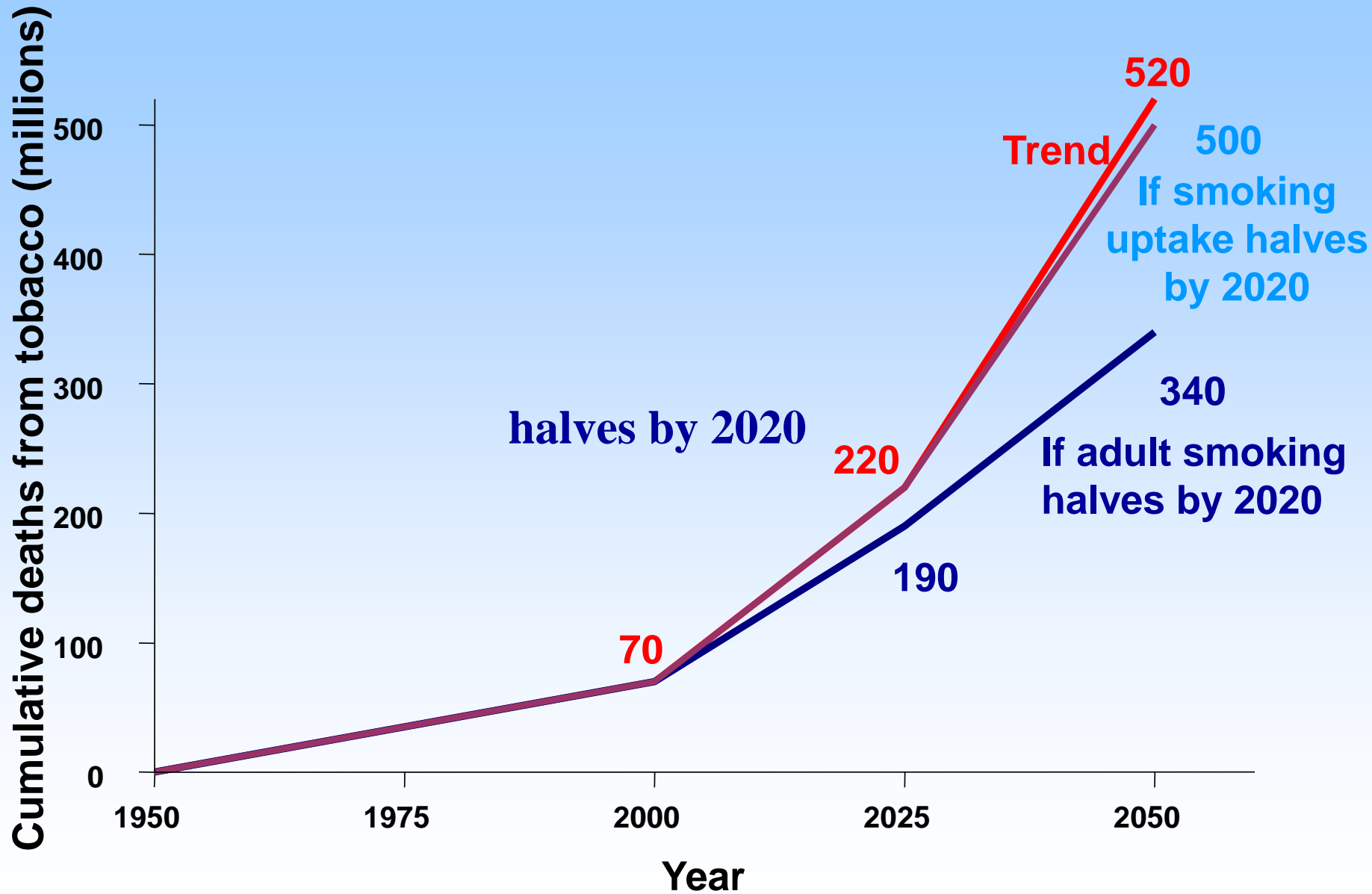
- **Counseling + Medication**
- **Talk with your consumers and encourage them to get treatment**
- **Everyone who wants to quit should have access to treatment**



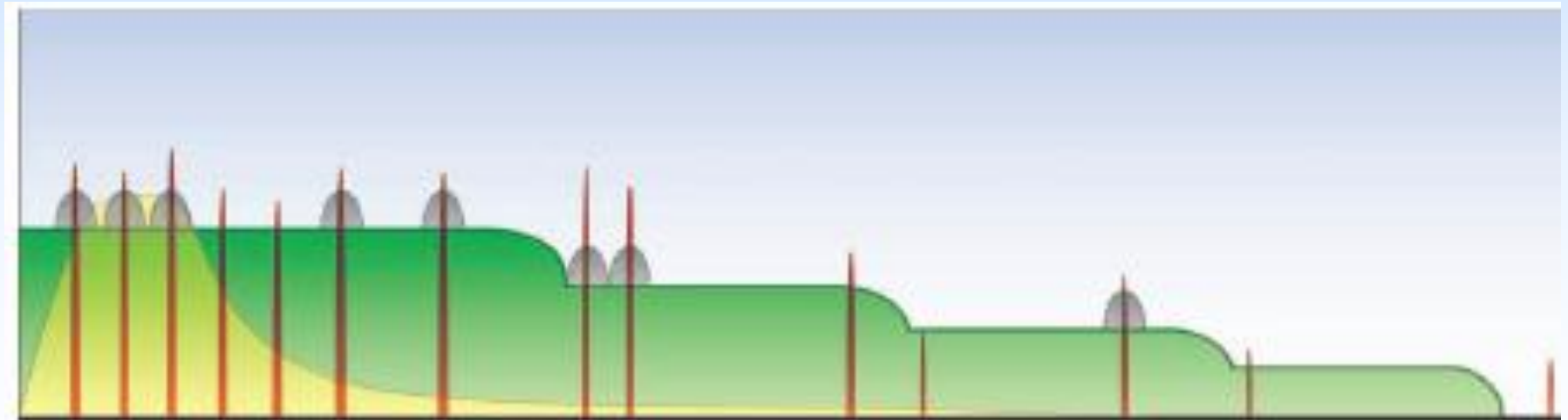
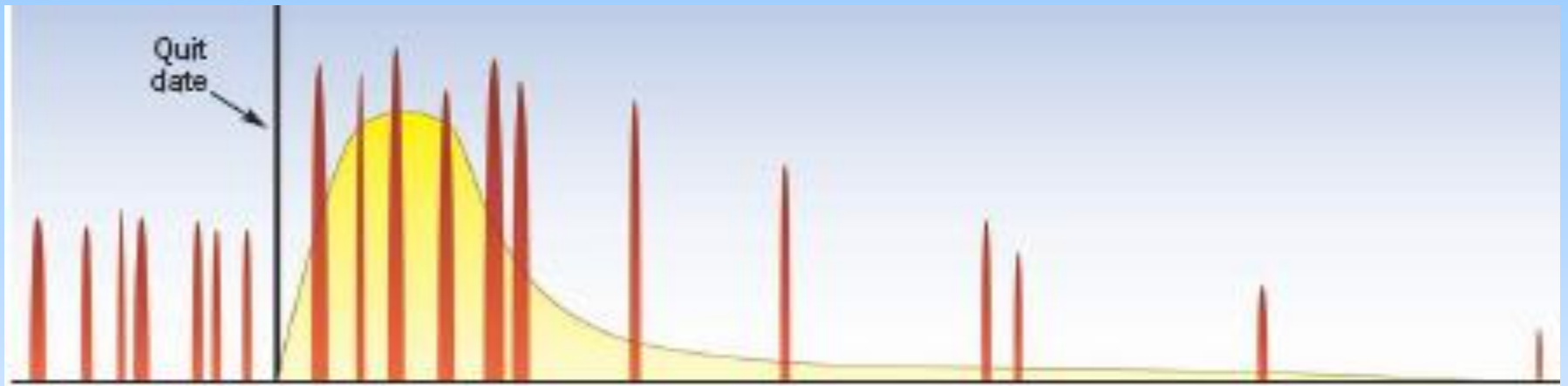
# Public health policies

- **Maintain smoke free environments**
- **Help people stop smoking**
- **Advertising restrictions and cost increases**
- **Provide accurate and comprehensive education**

# Scenarios: impact of cessation



# Help smokers to stop



# Summary

- **Speak the truth about tobacco addiction**
- **Understand why people misunderstand and why they have a difficult time quitting]**
- **Protect people from second hand smoke and beware of other tobacco products**