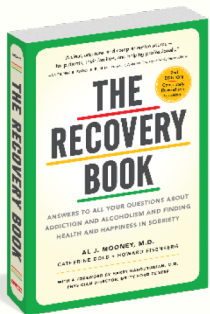


# From Science to Serenity:

## An experienced addictionist discusses recent developments in addiction research

April 9, 2019

- **Al J. Mooney MD, FAAFP, DABAM, CFII ASMEL, HIMS AME**
  - Author: THE RECOVERY BOOK
  - Member: NC Substance Abuse Professional Practice Board
  - Medical Director, Healing Transitions; Raleigh, NC
  - Adjunct Associate Professor of Family Medicine; UNC Chapel Hill



# **FROM SCIENCE TO SERENITY:**

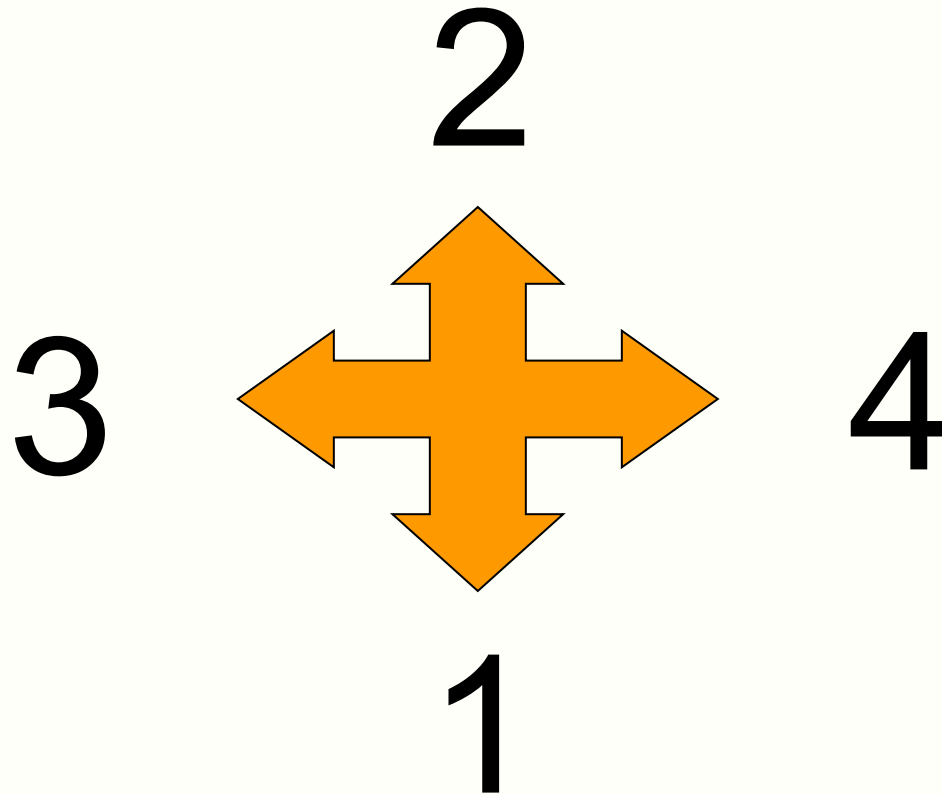
An experienced addictionist reflects on alcoholism and recovery

- 1. Review critical addiction knowledge**
- 2. Highlight 5 most important recent addiction research directions**
- 3. Challenges to finding solutions to the addiction epidemic**

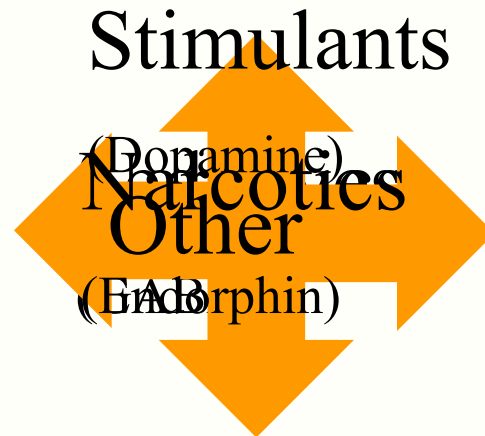
# **Three most important enduring principles of addiction knowledge**

1. Drugs of addiction
2. Tolerance & dependence
3. Commercialization of science

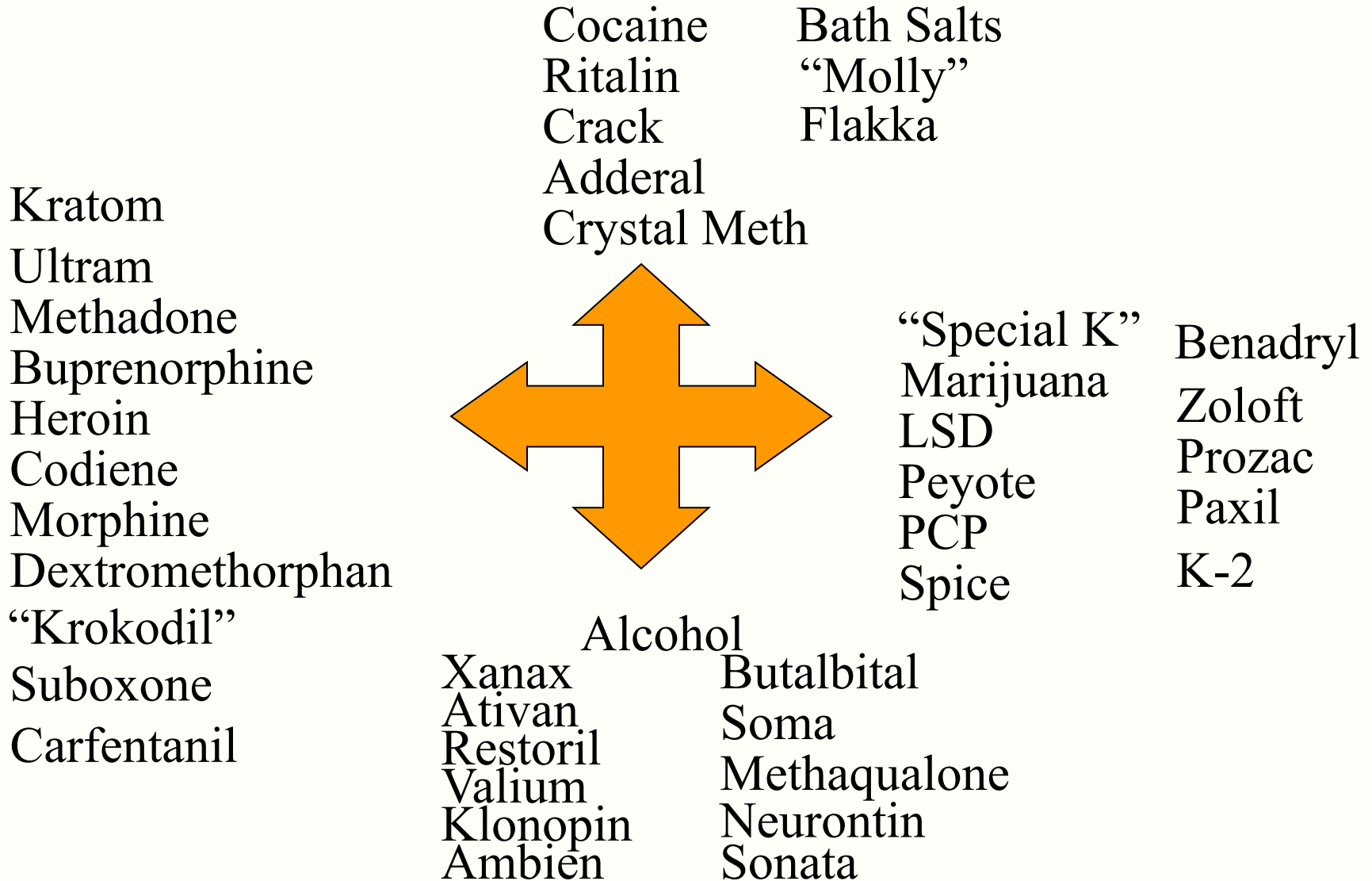
# Addiction 101: Drugs of addiction



# Addiction 101: Drugs of addiction



# Drugs of addiction



# Alcohol effect on brain

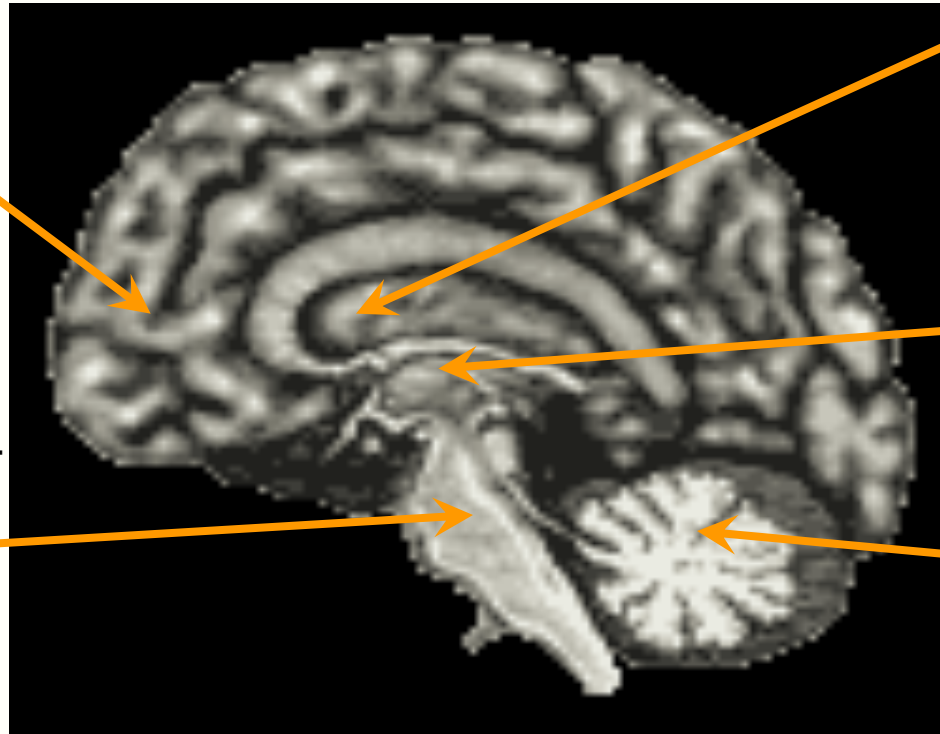
< 0.05% Prefrontal  
Cortex - disinhibition

0.05% Limbic  
System - emotional

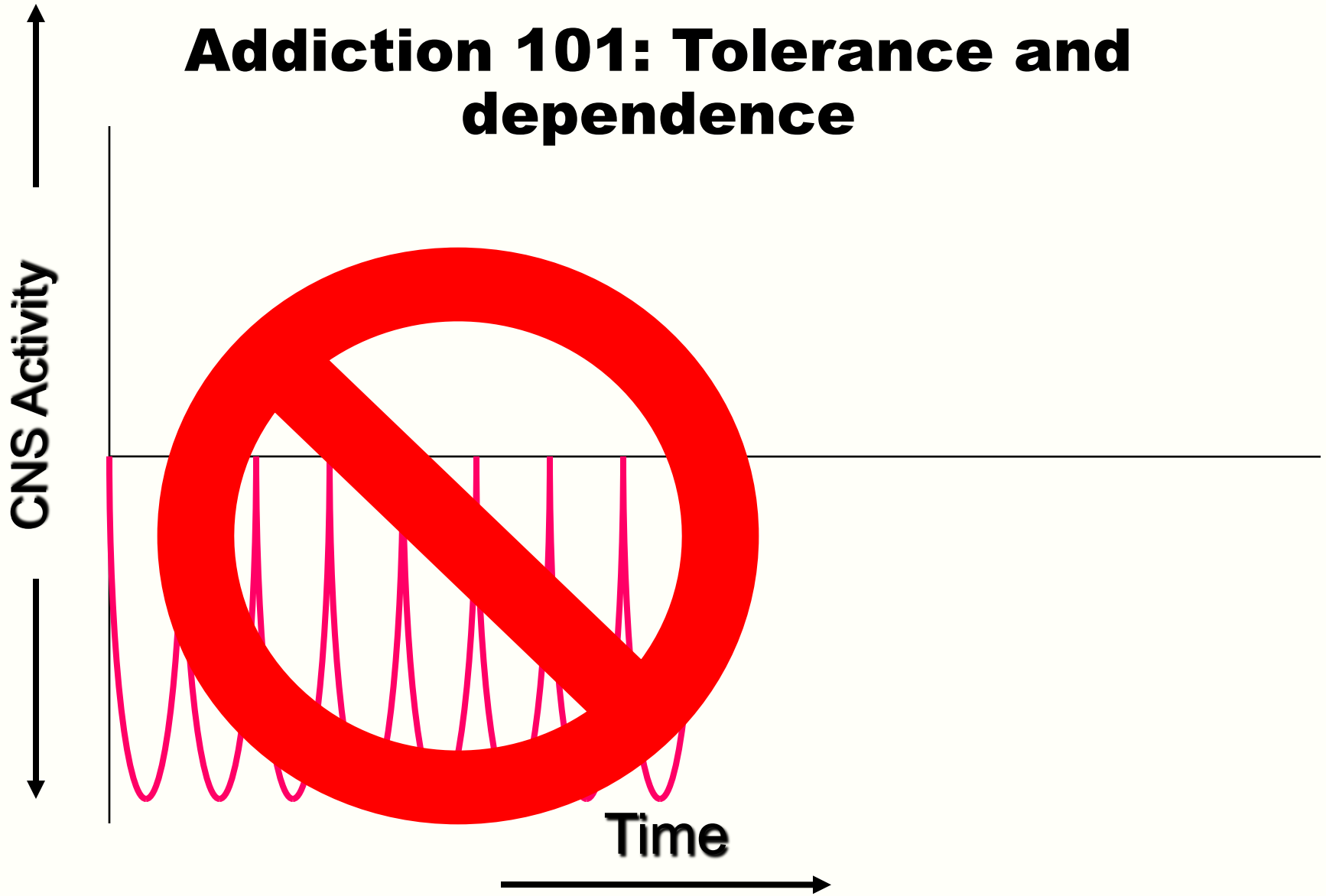
>0.20% RAS  
hypnosis (sleep)

>0.30% Medulla -  
Respiratory  
depression and  
death

>0.10% Cerebellum  
- ataxia

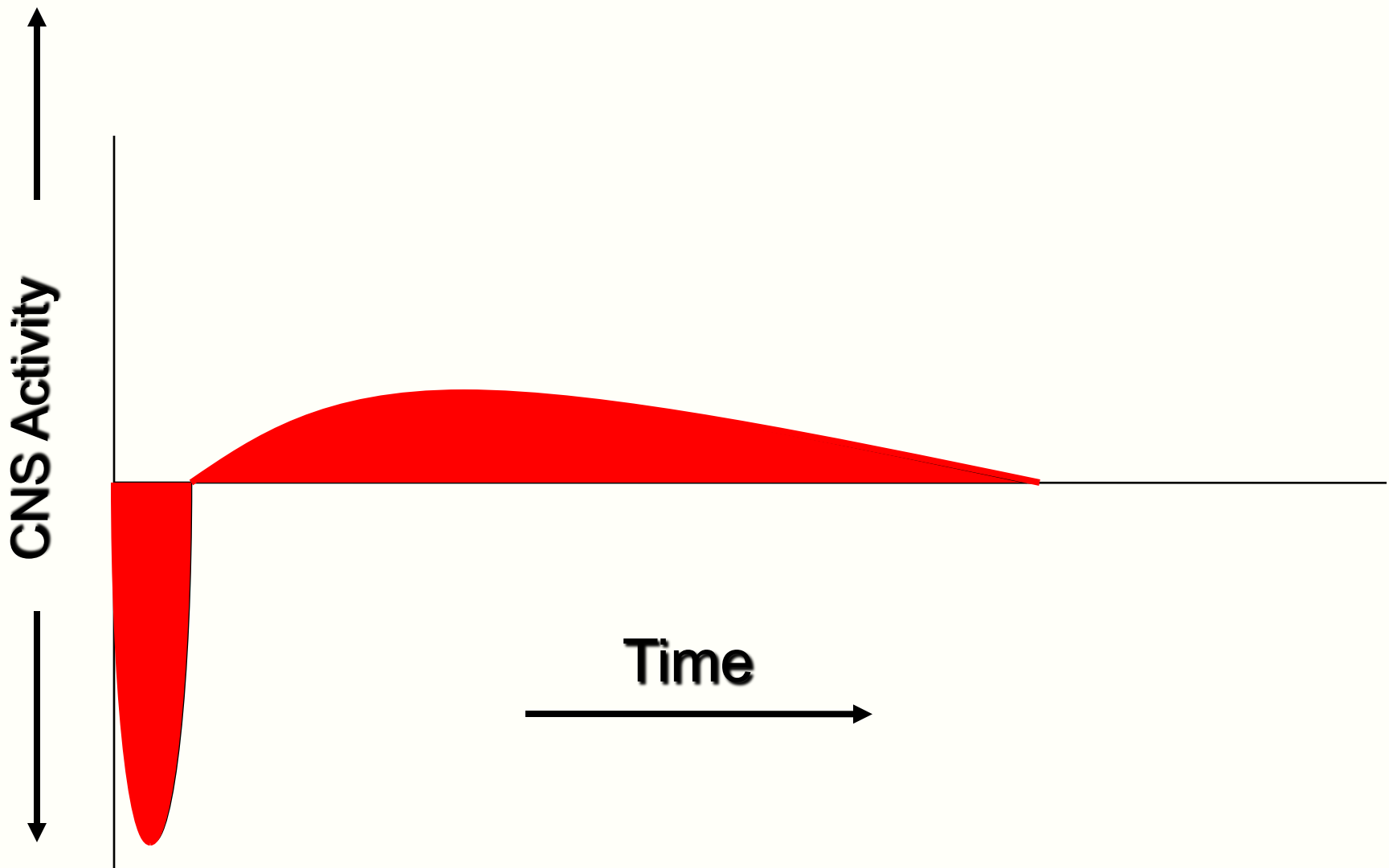


# Addiction 101: Tolerance and dependence

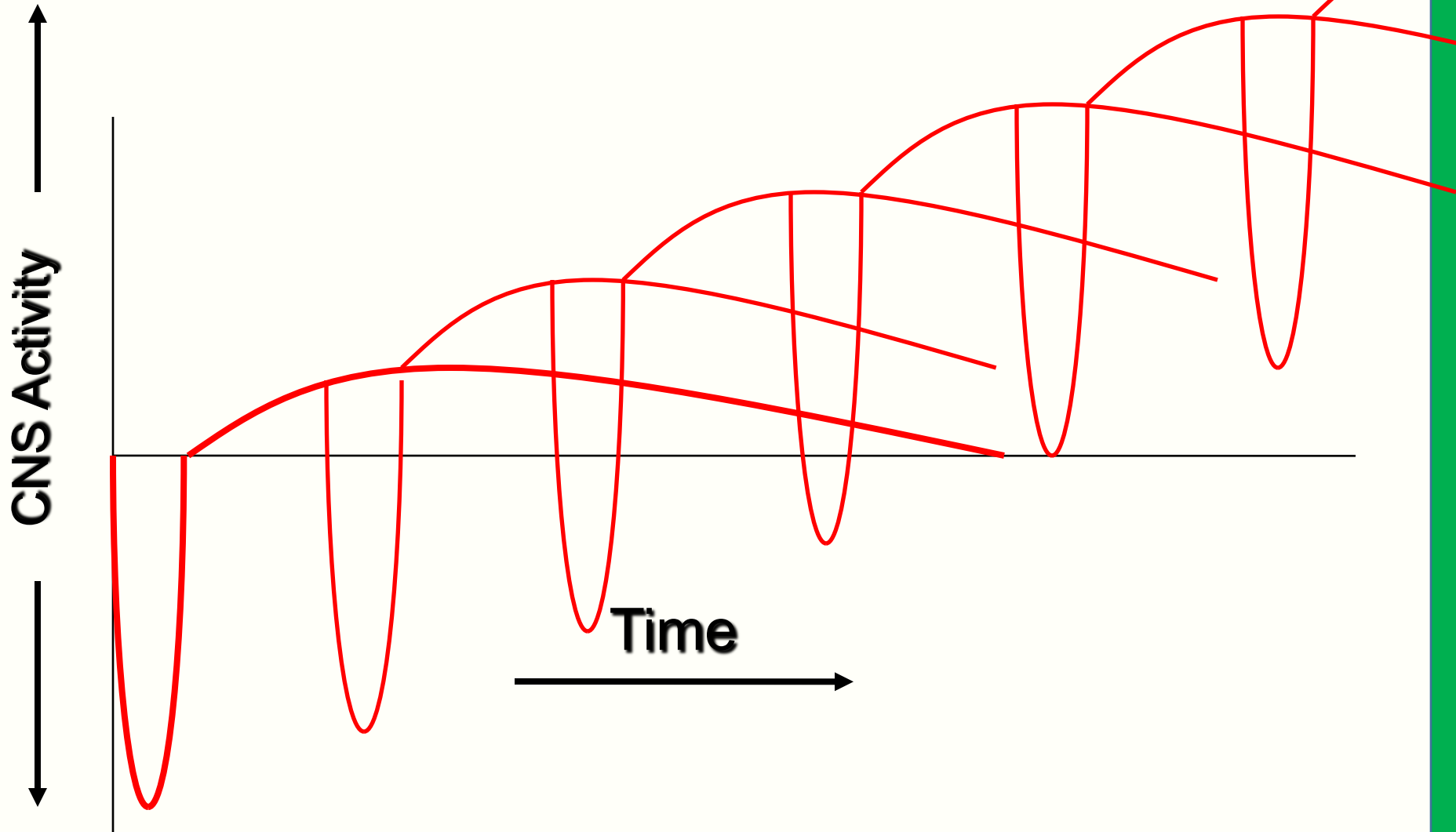




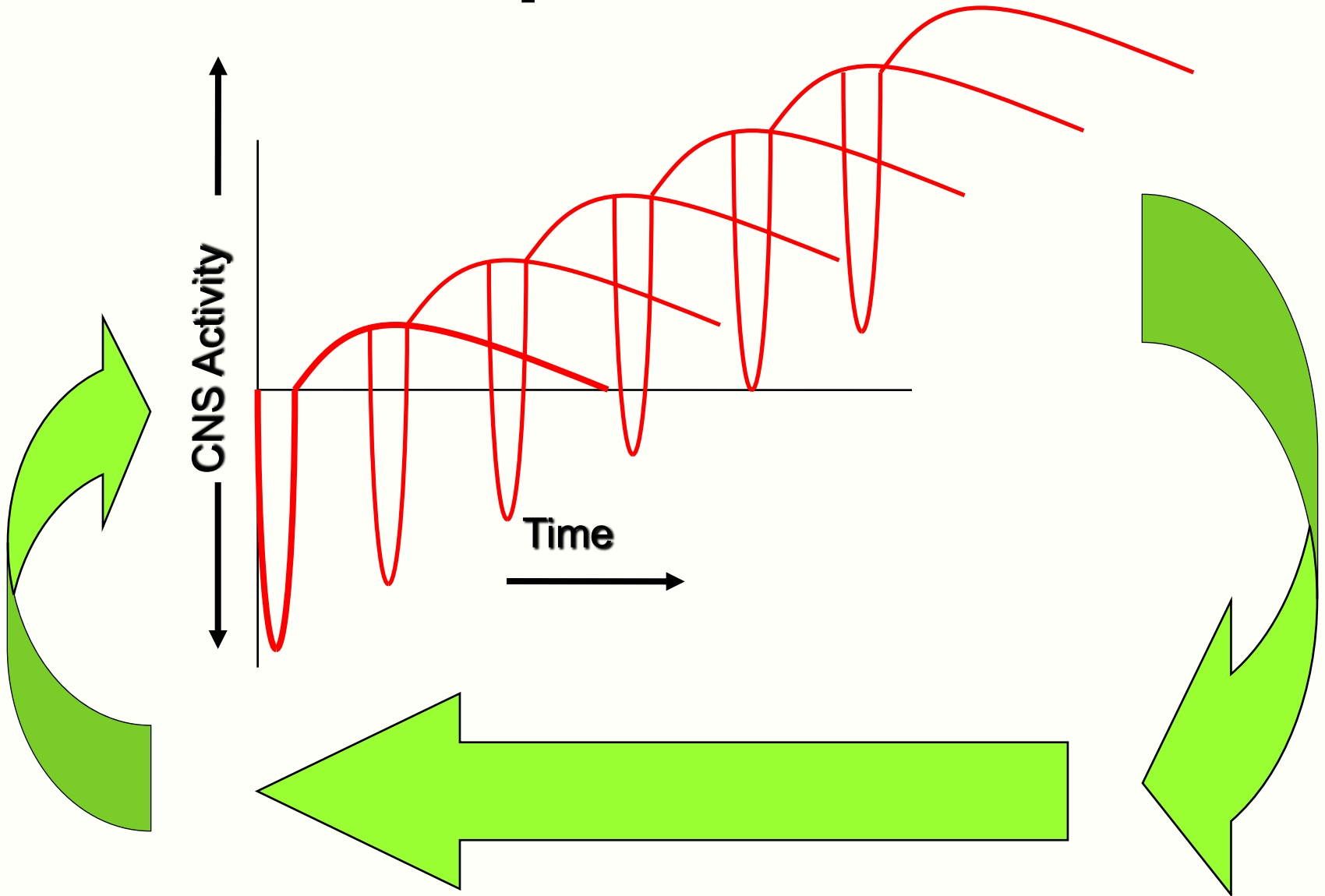
# Tolerance and dependence



# Tolerance and dependence



# Tolerance and dependence vs. addiction



# **Consequences of commercializing science**

- Flaws from overreliance on an “evidence based” approach
  - Always retrospective, so evidence serves best as the foundation of good practice
  - Evidence can support practices based on untruths (antibacterials, allergies)
  - Inaccurate observations may reflect the truth

# **Consequences of commercializing science**

- Flaws from overreliance on an “evidence based” approach
  - Always retrospective, so evidence serves best as the foundation of good practice
  - Evidence can support practices based on untruths (antibacterials, allergens)
  - Inaccurate observations may reflect the truth
  - Under control of those with money and power
- Market model of recurring revenues (vaccines vs life style Rx's)
- Historical cycle of drug solutions to drug problem

# Willingway tranquilizer rule

- There are old drugs
- And there are new drugs
- The old drugs are addicting
- And the new drugs are non-addicting
- When the new drugs become old drugs
- They become addicting and are replaced by new non-addicting drugs

# Disease facts – #1 health problem

- Fatal illness
  - One alcohol related death every 10 seconds (globally)
  - 100,000 deaths annually
  - 170 deaths/day from overdose alone (USA)
  - YPLL (2.3 Million) – Cancer, Heart Disease
  - >80% unanticipated deaths in community mental health
- Most important Health problem
  - \$466 billion annual cost of NOT treating
  - No claims data to use for policy formulation
- 7% U.S. population afflicted
- 1/4 of hospital admissions (#1 diagnosis of military admissions)
- Family morbidity 43% (76,000,000)
- 100% increase in healthcare costs
- Primary cause of preventable birth defects
- Treatment yield of \$7 for \$1 expense
- \$39 Yield for each \$1 spent in medical settings
- Treatment success >90% (FAA IHMS)
- Prevention reduces risk by 75%

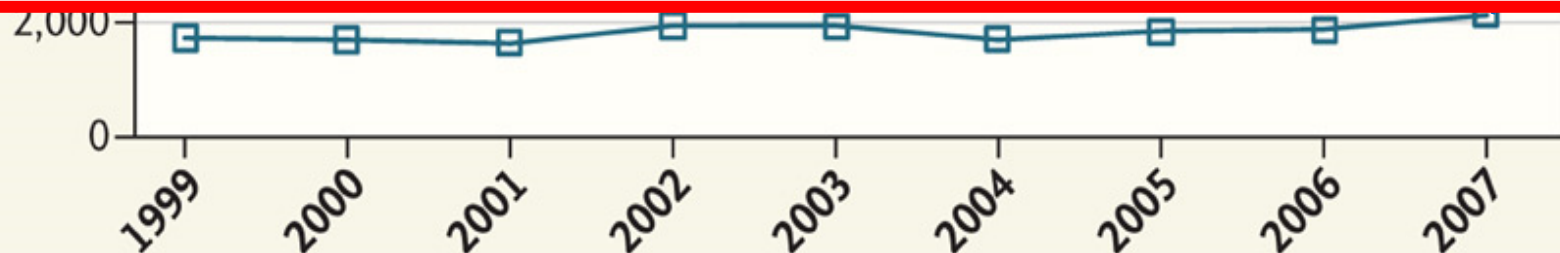
# Disease facts – #1 health problem

- Fatal illness
  - One alcohol related death every 10 seconds
  - 100,000 deaths annually in USA
  - YPLL (2.3 Million) = Cancer, Heart Disease
  - >80% unanticipated deaths in community mental health
- Most important Health problem
  - \$466 billion annual cost of NOT treating
  - No claims data to use for policy formulation
- 7% U.S. population afflicted
- ¼ of hospital admissions (#1 diagnosis of military admissions)
- 4% of NICU admission are for neonatal abstinence syndrome
- Family morbidity 43% (76,000,000)
- 100% increase in healthcare costs
- Primary cause of preventable birth defects
- Treatment yield of \$7 for \$1 expense
- \$39 Yield for each \$1 spent in medical settings
- Treatment success >90% (FAA HIMS)
- Prevention reduces risk by 75%

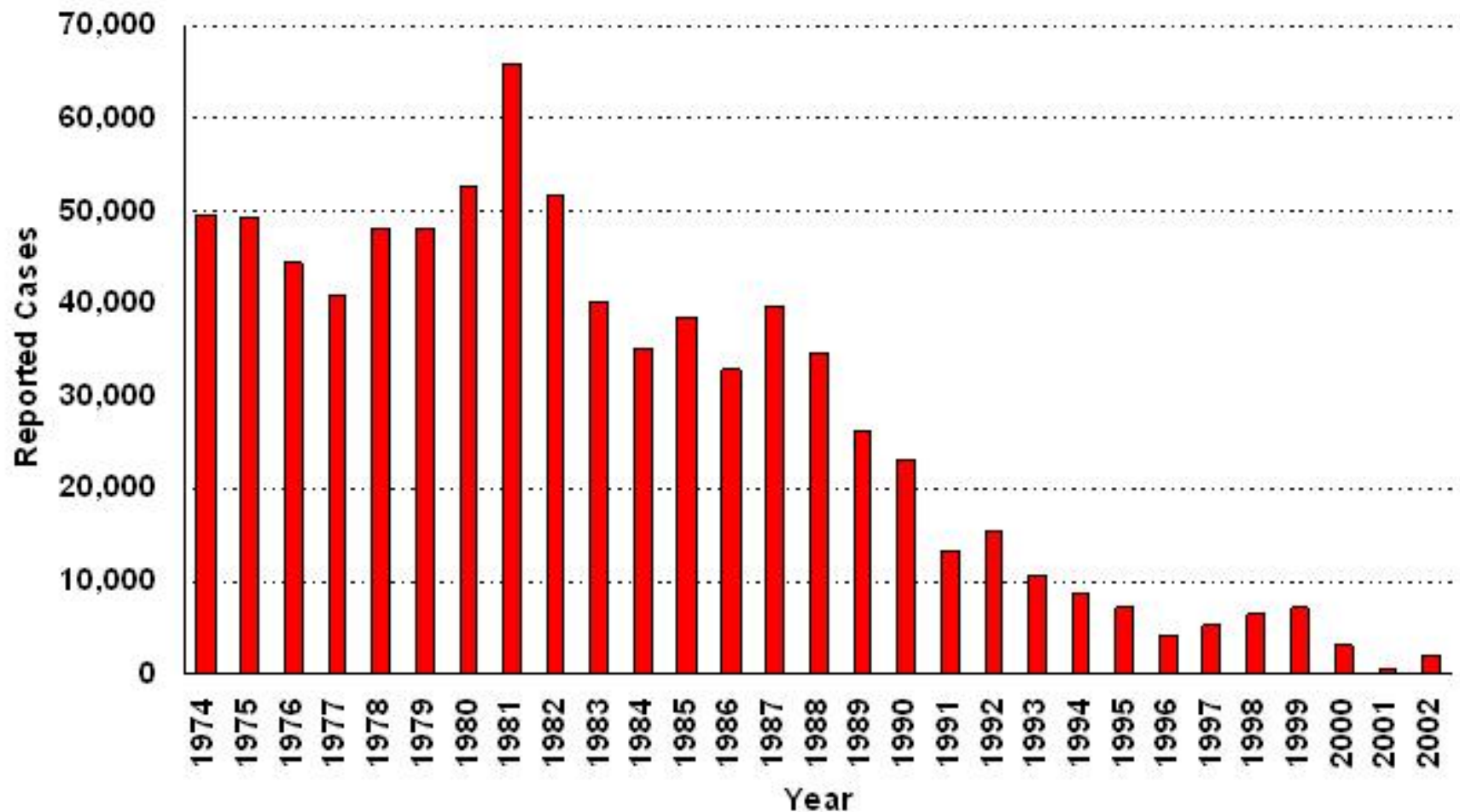


**B Deaths from Unintentional Drug Overdoses in the United States According to Major Type of Drug, 1999–2007**

**>42,000 in 2016**

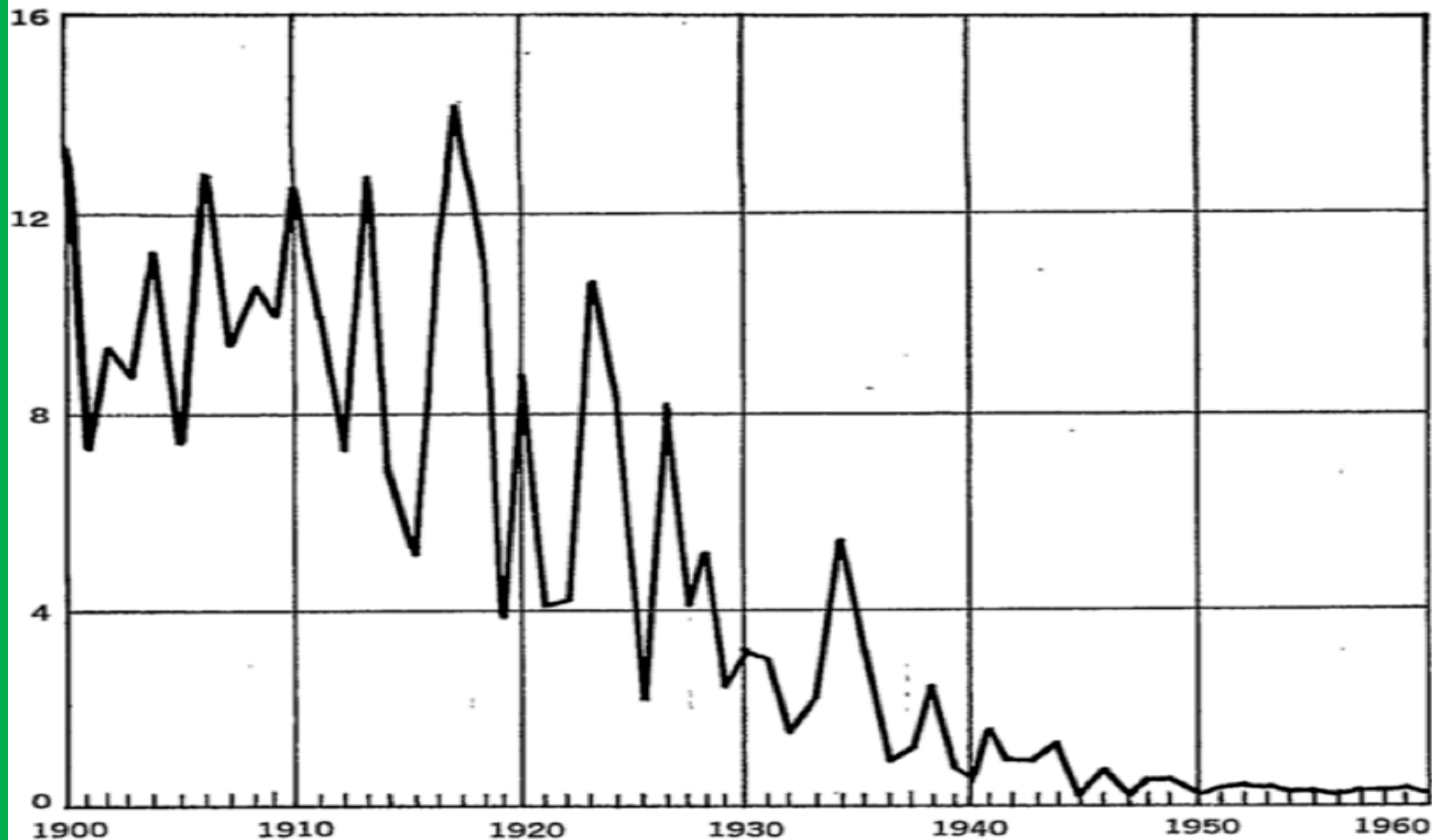


# Global annual reported polio cases, 1974-2002

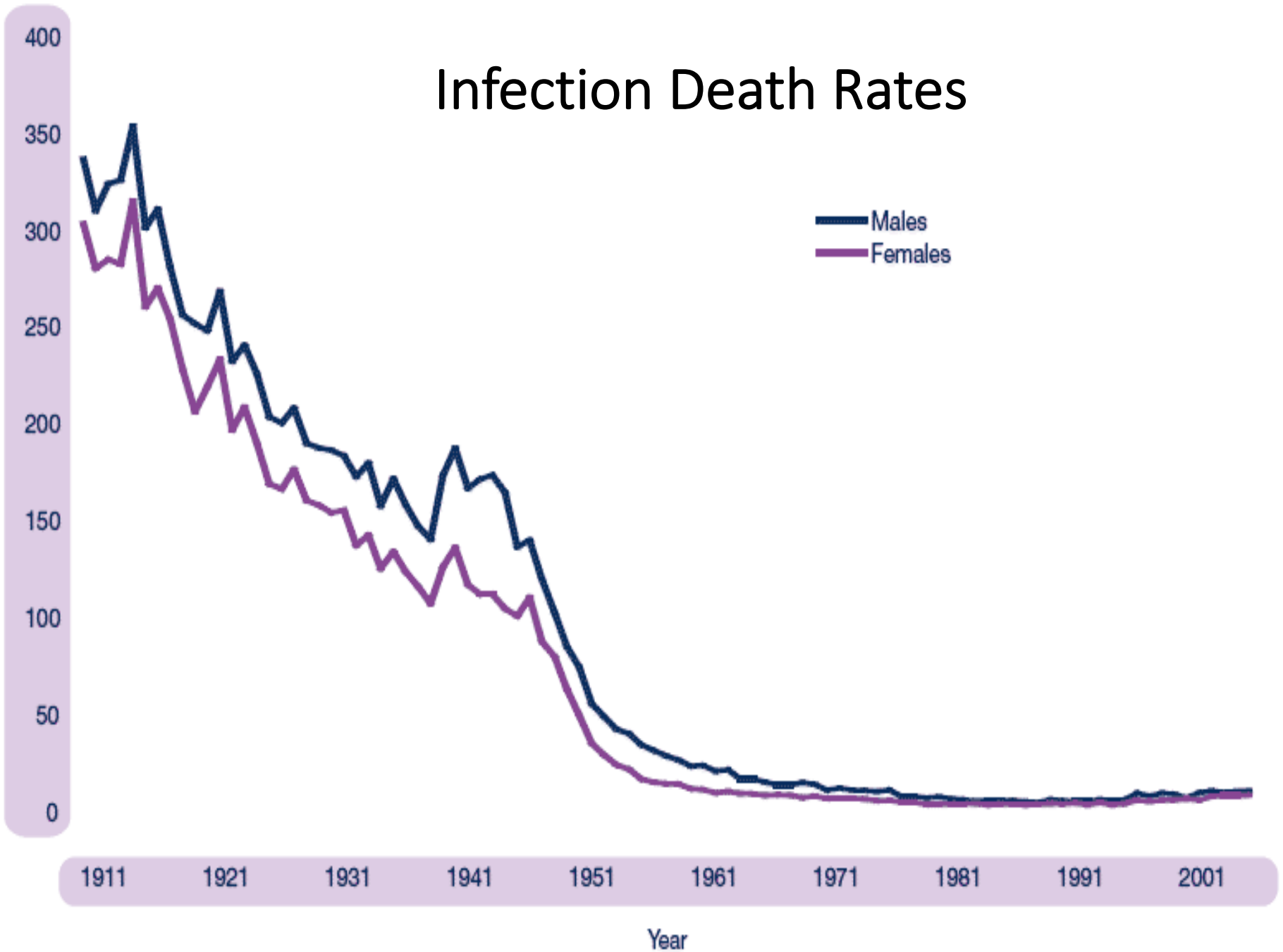


**Figure 19.—Death Rates for Measles: Death-registration States, 1900–32, and United States, 1933–60**

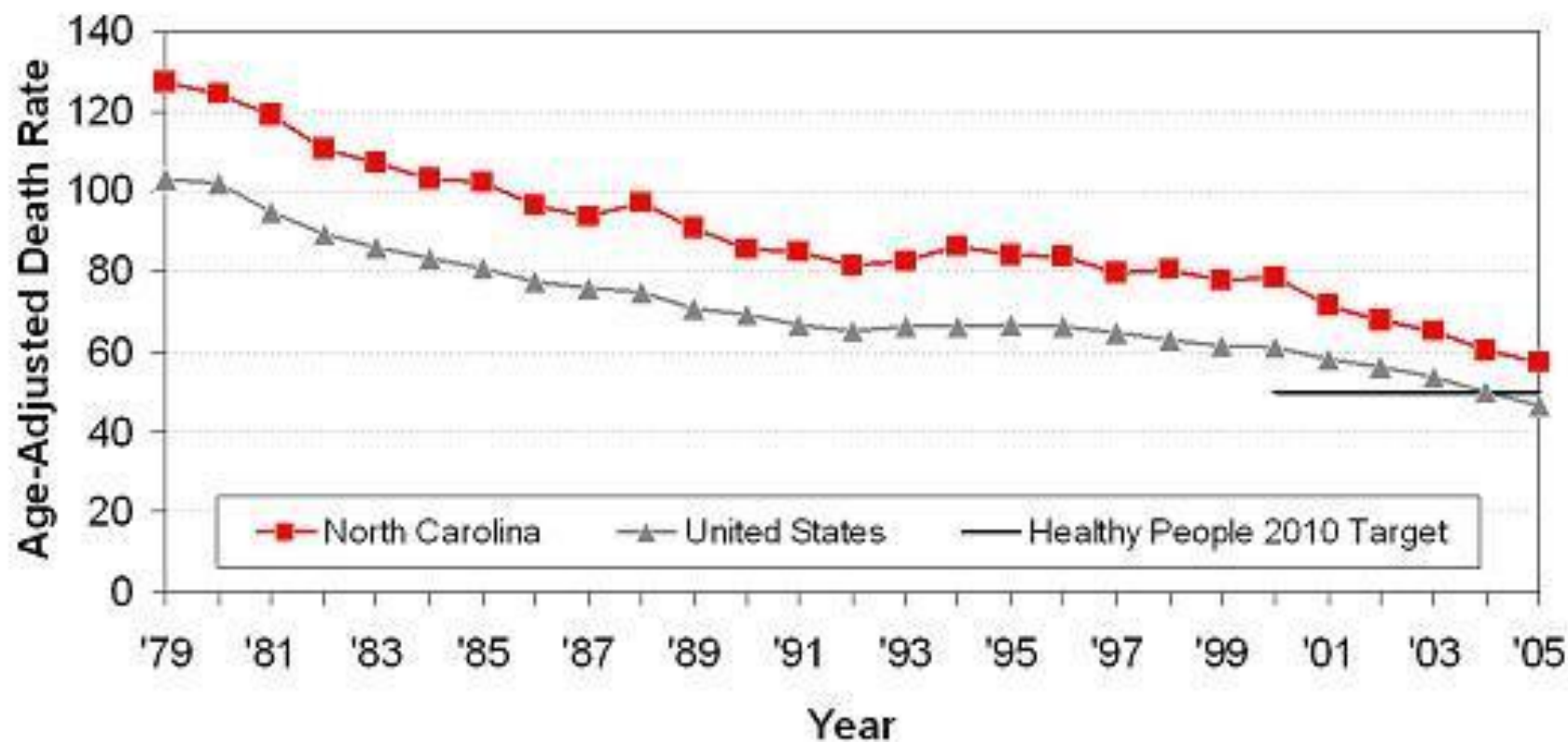
(Rates per 100,000 population).



# Infection Death Rates

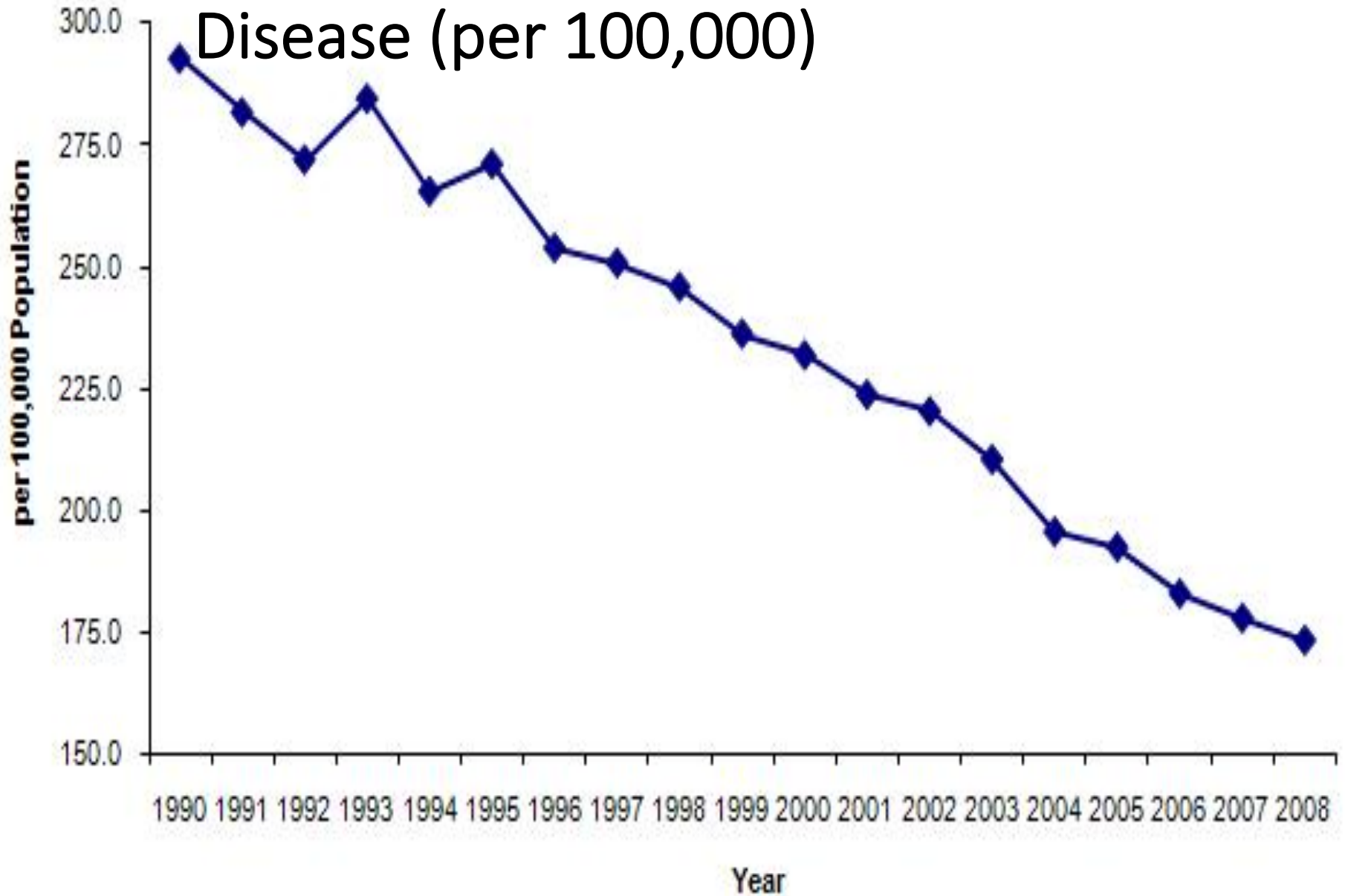


# Stroke Death Rates, 1979-2005

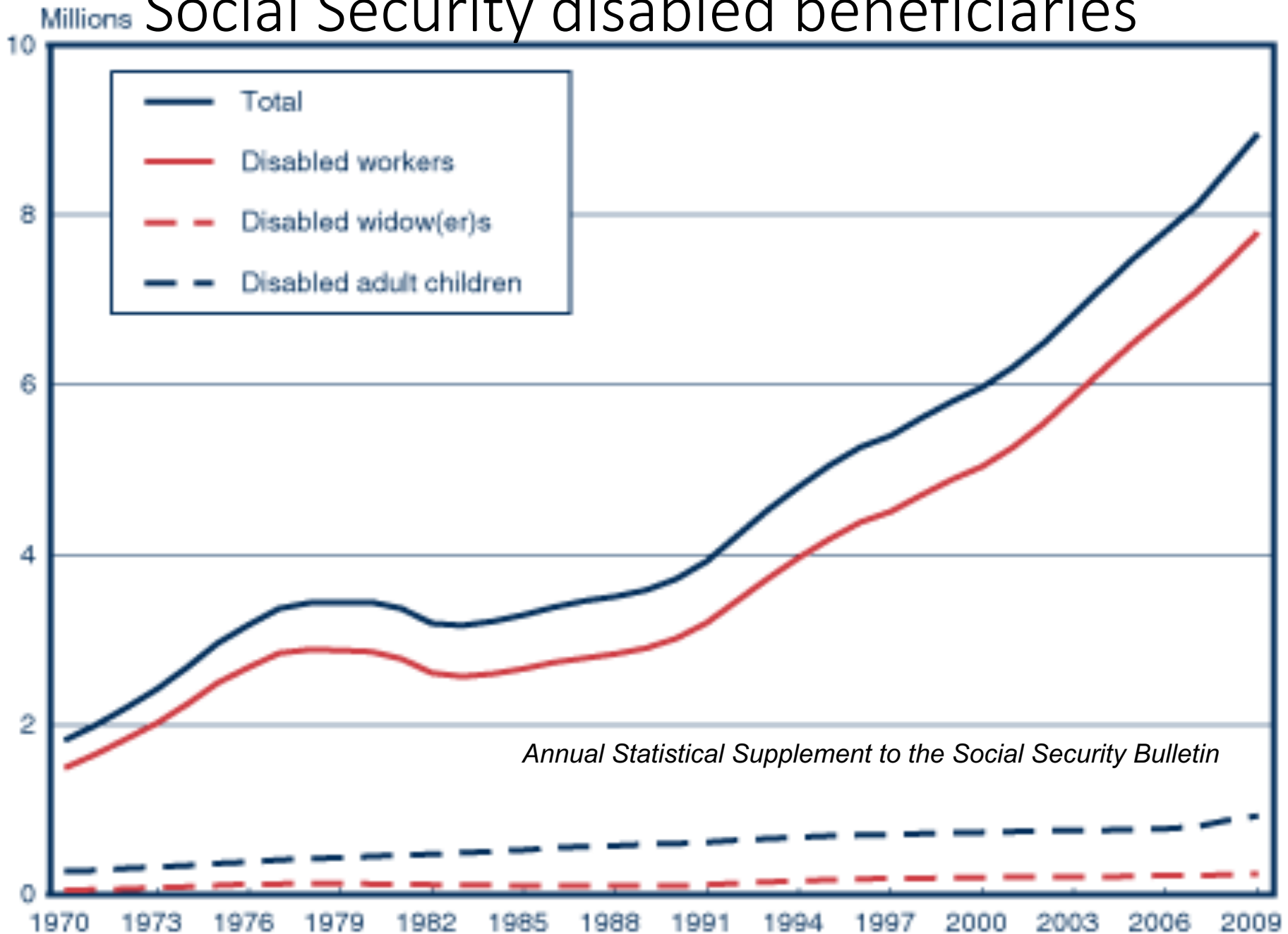


1999-2005: ICD-10 codes I60-I69; 1979-1998: ICD-9 codes 430-434, 436-438 multiplied by comparability ratio of 1.0588.  
Rates per 100,000 population, age-adjusted to the 2000 U.S. standard population.  
Data Source: Compressed Mortality File, CDC Wonder.

# Age Adjusted Mortality Rate For Heart Disease (per 100,000)

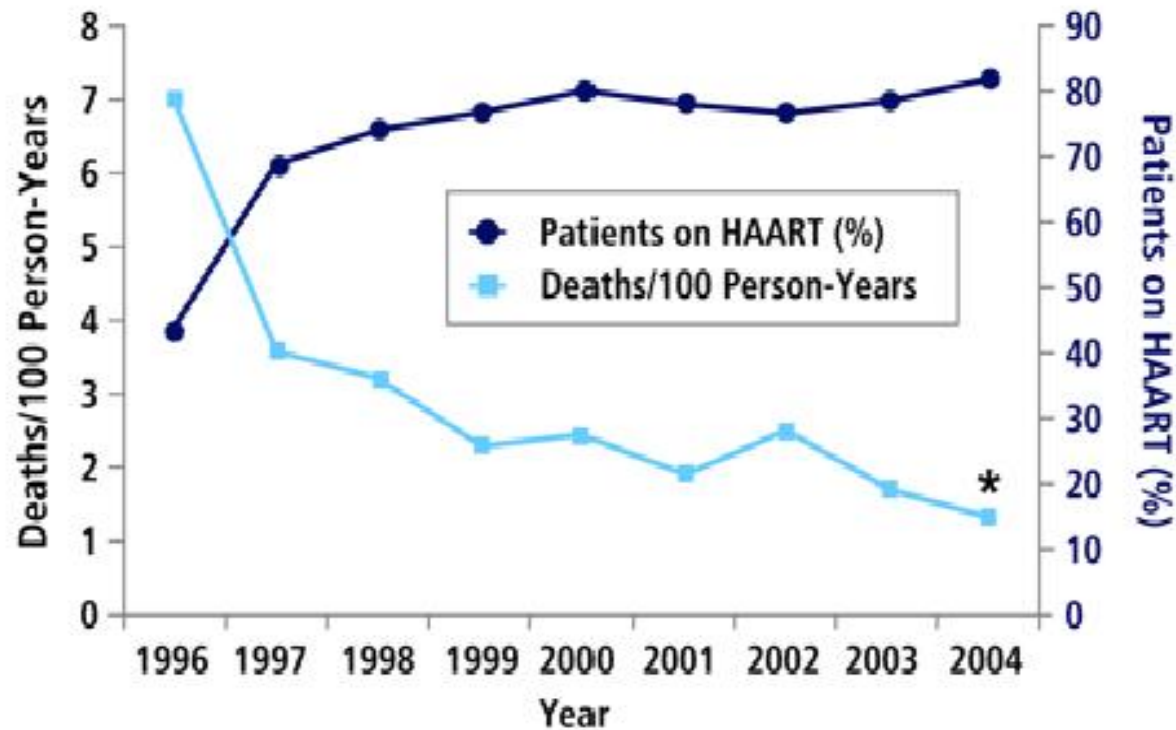


# Social Security disabled beneficiaries



# HIV Mortality with more access to treatment

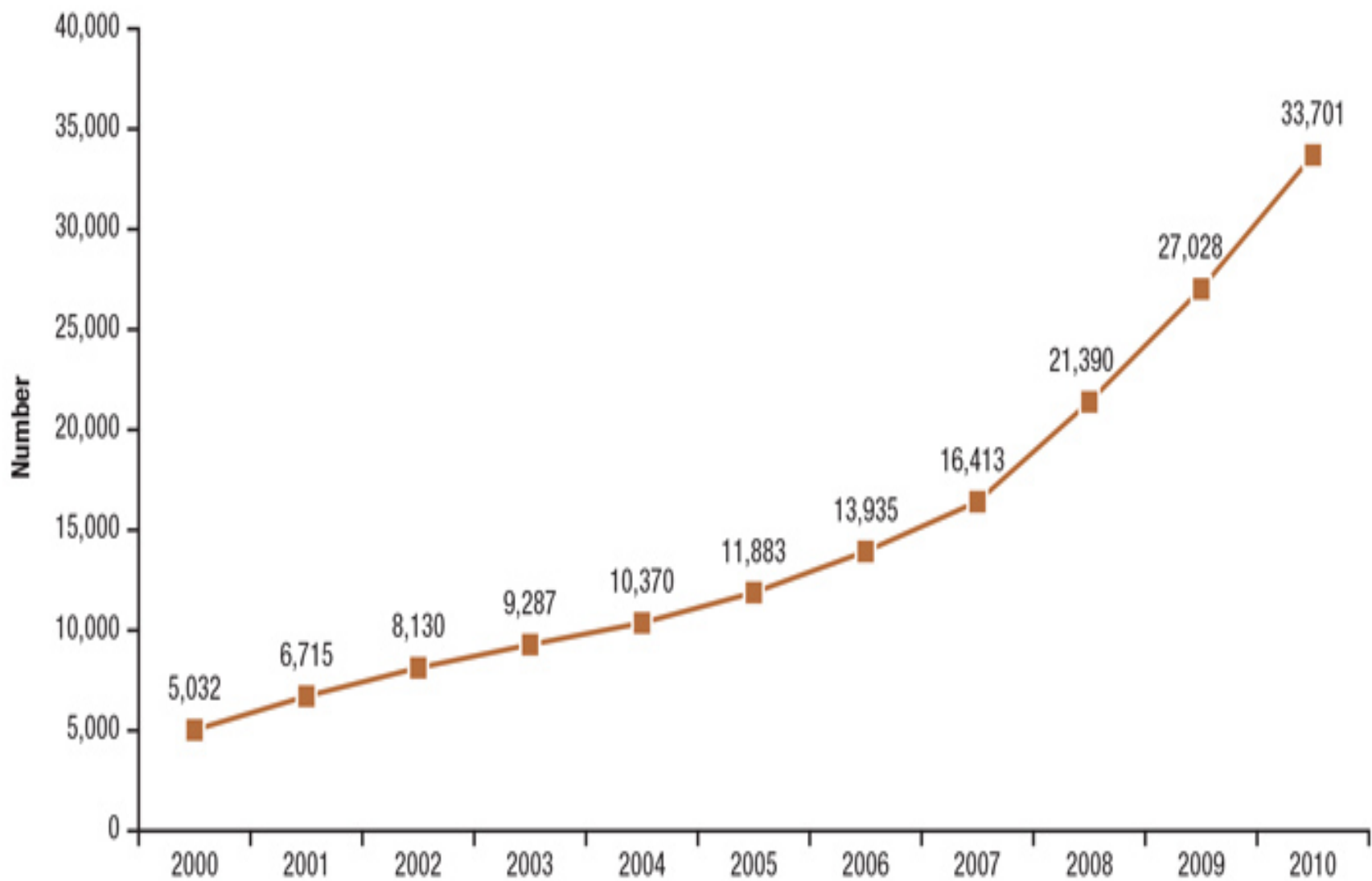
## Mortality and HAART Utilization Over Time



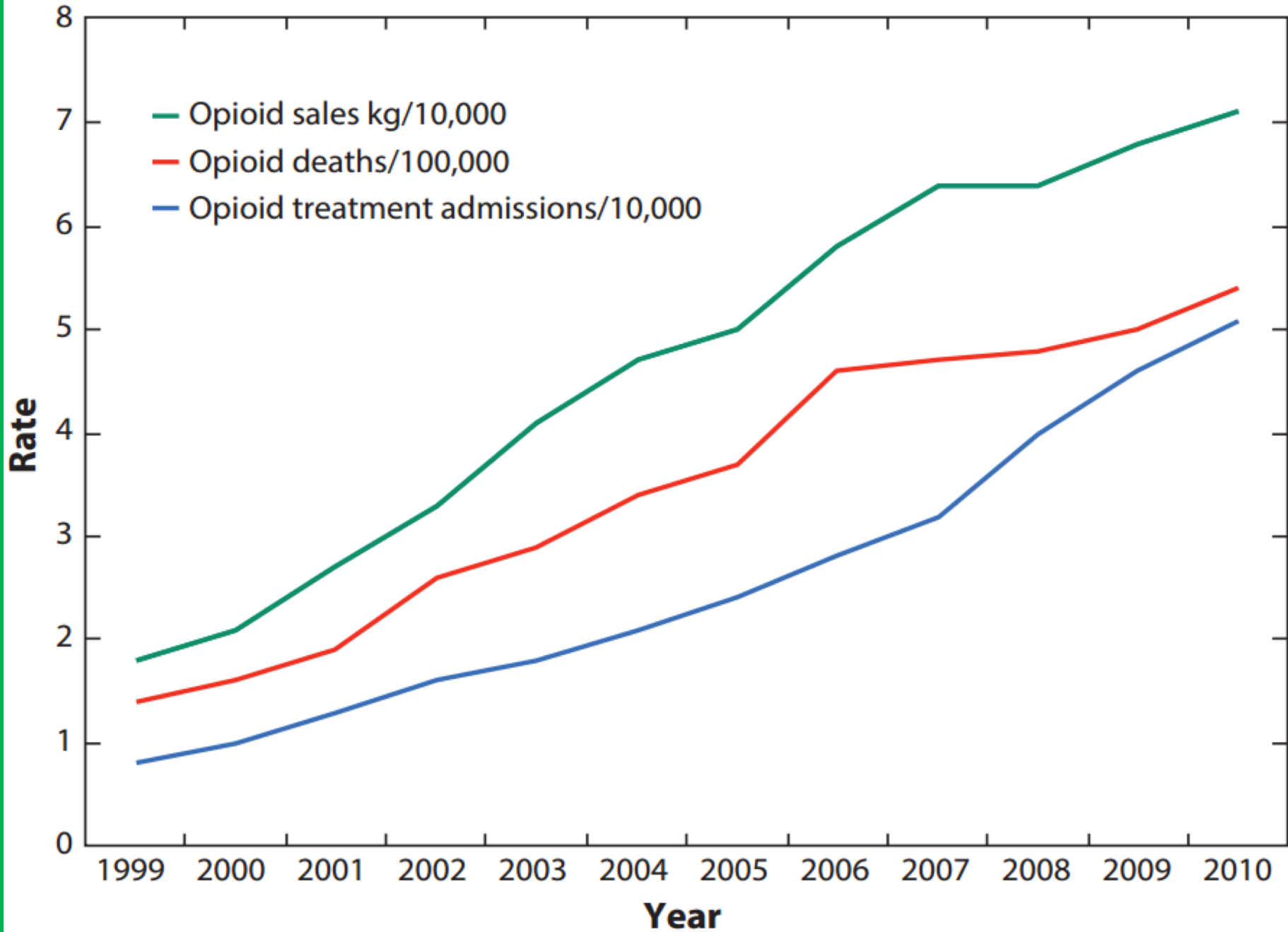
\*  $P = .008$  for trend

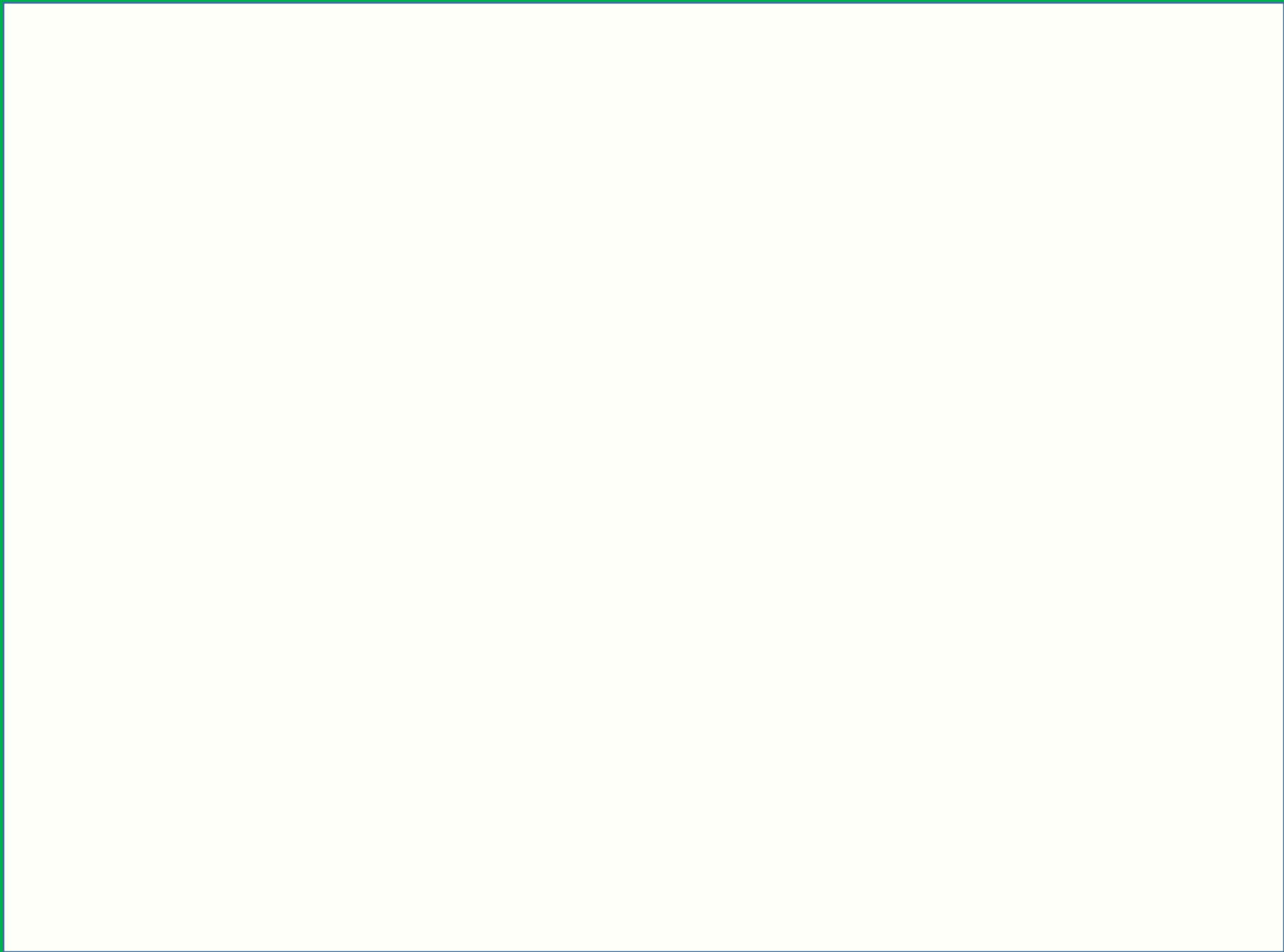
Palella FJ, et al. *J Acquir Immune Defic Syndr*. 2006;43:27-34.

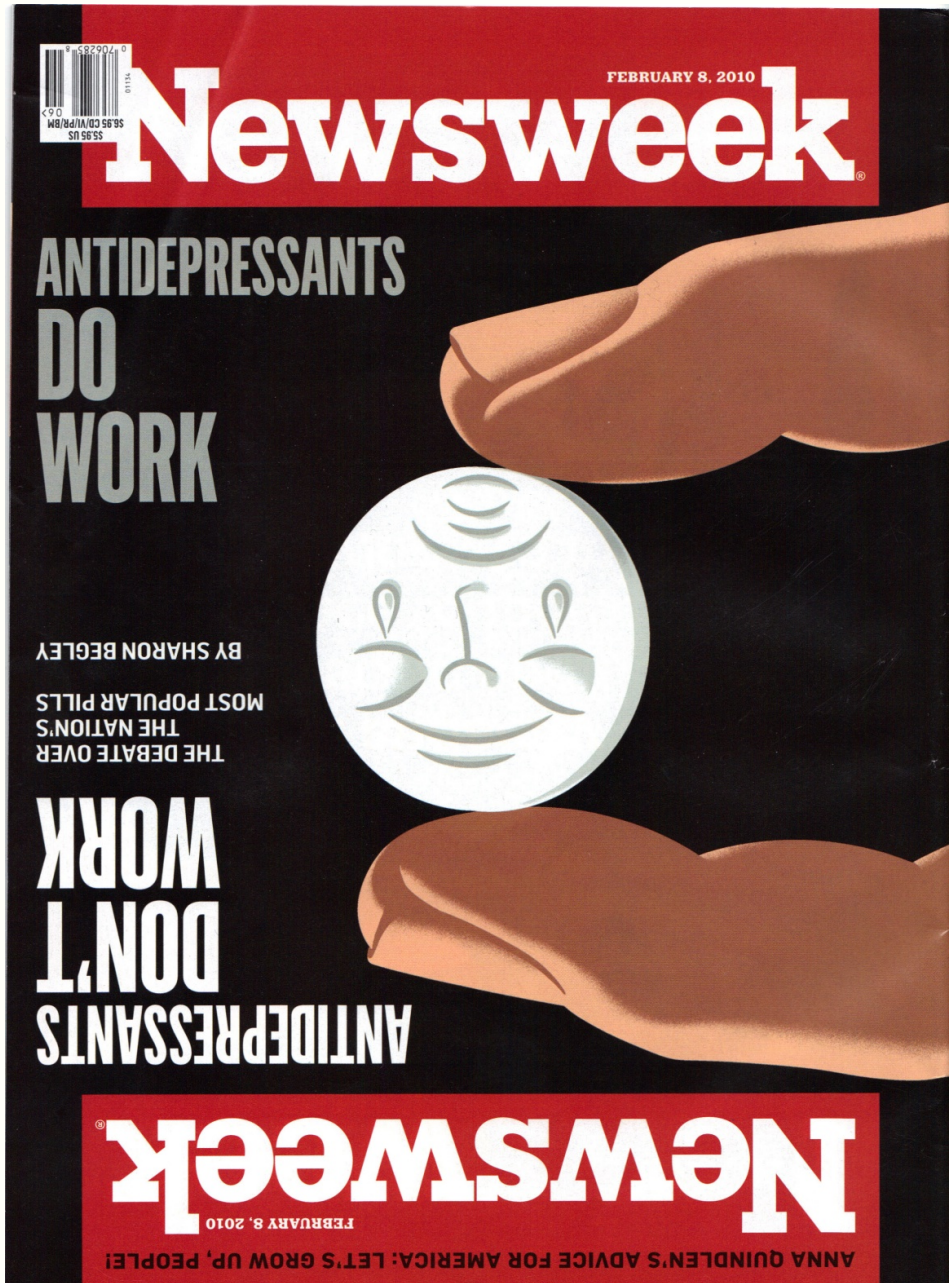




Source: SAMHSA Treatment Episode Data Set (TEDS), 2000 to 2010.







Andrews PW, Thomson JA Jr, Amstadter A and Neale MC (4/24/2012) Primum non nocere: an evolutionary analysis of whether antidepressants do more harm than good. Front. Psychology 3:117.

# How to be “blinded by the evidence” in a “post-truth” era

- Scientific methods can be used in ways that corrupt measurement of meaningful outcomes
  1. Length of study misrepresents outcomes of practice usage (Xanax, FDA)
  2. Measure effects to justify use of the medication (Ambien, methadone)
  3. Ignore illness criteria which don't support intended study outcomes (DSM V exclusion for SUD)
  4. Avoid measurement of side effects (atypicals, antidepressants)
  5. Emphasize statistical endpoints irrelevant to efficacy (acamprosate) (Drug Court)
  6. Pay researchers to publish positive outcomes (Bankole Johnson)
  7. Don't report negative results (Irving Kirsh FOIA discoveries)
  8. Overemphasize positive results (Acamprosate NNT)
  9. Publish research ghostwritten by marketing staff under physician bylines
  10. Avoid comparison with effective alternatives (Phenob, Suboxone, abstinence)
  11. Generalize data to populations excluded from study (alcoholics)
  12. Infer efficacy by ignoring oscillations in illness severity
  13. Only count results that look good (look for “response rate”) (Naloxone)
  14. Define a disease by an anticipated drug effect (“Serotonin deficiency”, SWSD)

## **Fines and Settlements for illegal or unethical drug marketing practices**

- Astra Zeneca \$520,000,000 Seroquel
- Pfizer \$2,300,000,000 Geodon, Lyrica ...
- Purdue Pharma \$634,500,000 Oxycontin
- Lilly \$1.400,000,000 Zyprexa
- Glaxo-Smith-Kline \$3,000,000,000 Paxil, Welbutrin, ...
- Abbott \$1,600,000,000 Depakote
- Johnson and Johnson \$2,200,000,000 Risperdal
- Bristol-Myers Squibb \$515,000,000 Abilify

# Most important recent addiction research directions

- 1. What causes it?** - Allergy: “New” theory explains addiction insanity
- 2. What keeps it going?** - Denial: Neuroscience of cognitive dissonance
- 3. Why can't we stop it?** - Motivation: The science of readiness to change
- 4. Why is healing from it so slow?** - Lifting the Fog: Neuroplasticity
- 5. What keeps it away forever?** - Lifetime Healing: Recovery Zone System

# **1. Allergy & Immunity**



# **Insanity**

- Doing the same thing over and over again expecting a different result.

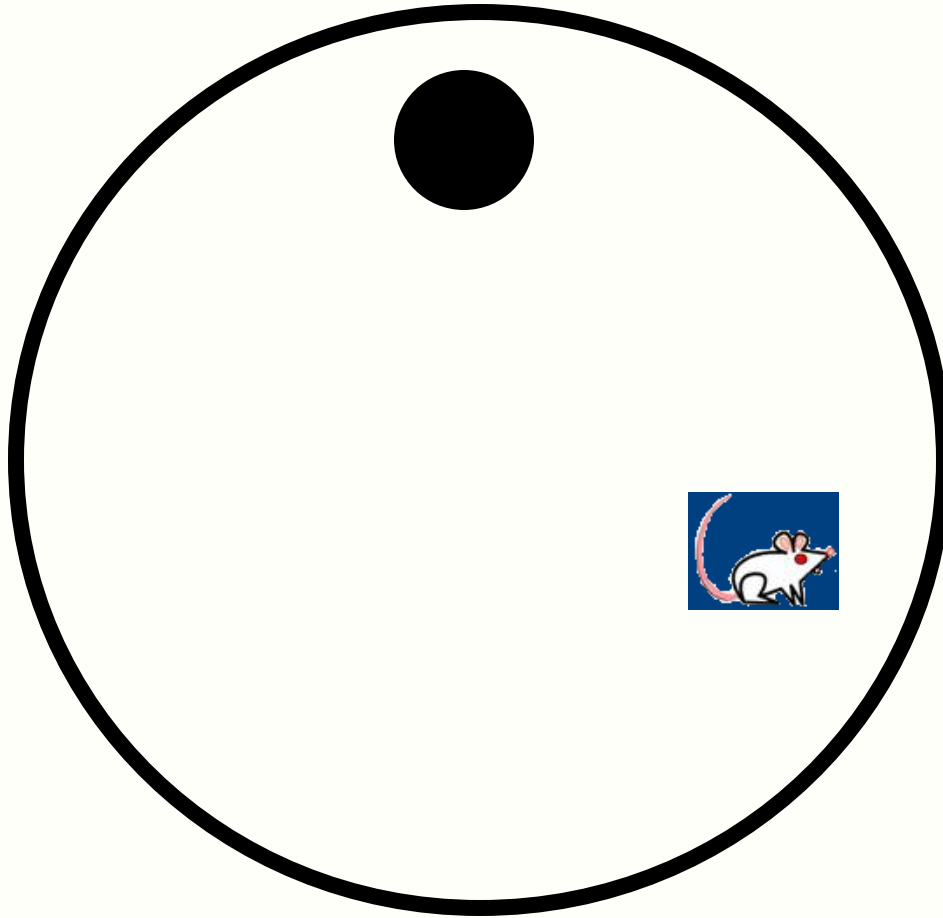
# **Addiction Insanity**

- Continuing to drink or use drugs in spite of awareness that one should not.

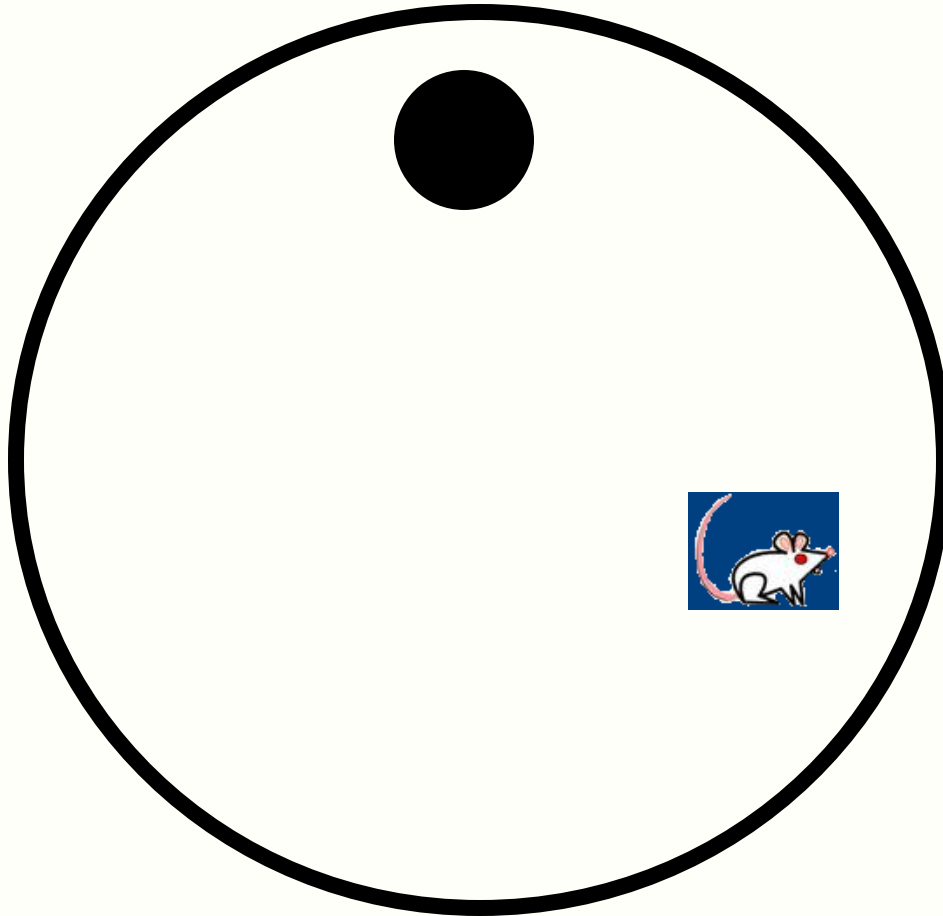
“The doctor’s theory of an allergy interests us”

- **Alcoholics Anonymous – The Doctor’s Opinion (1939)**

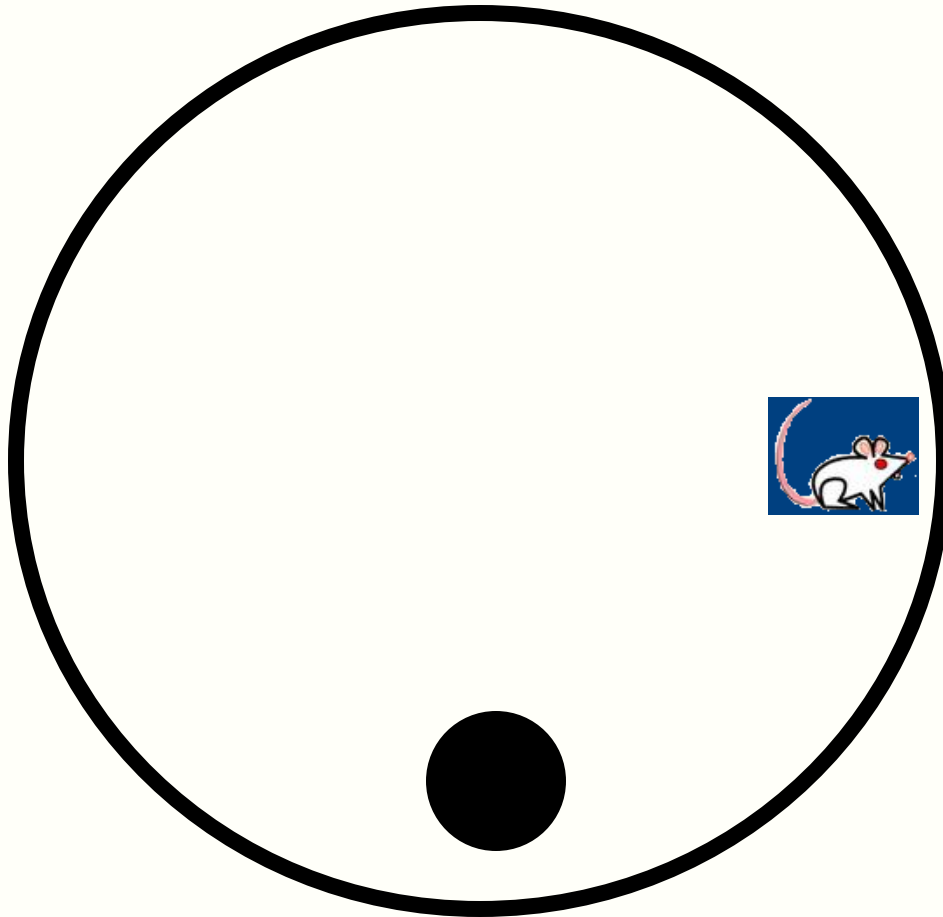
# Non-alcoholic rat



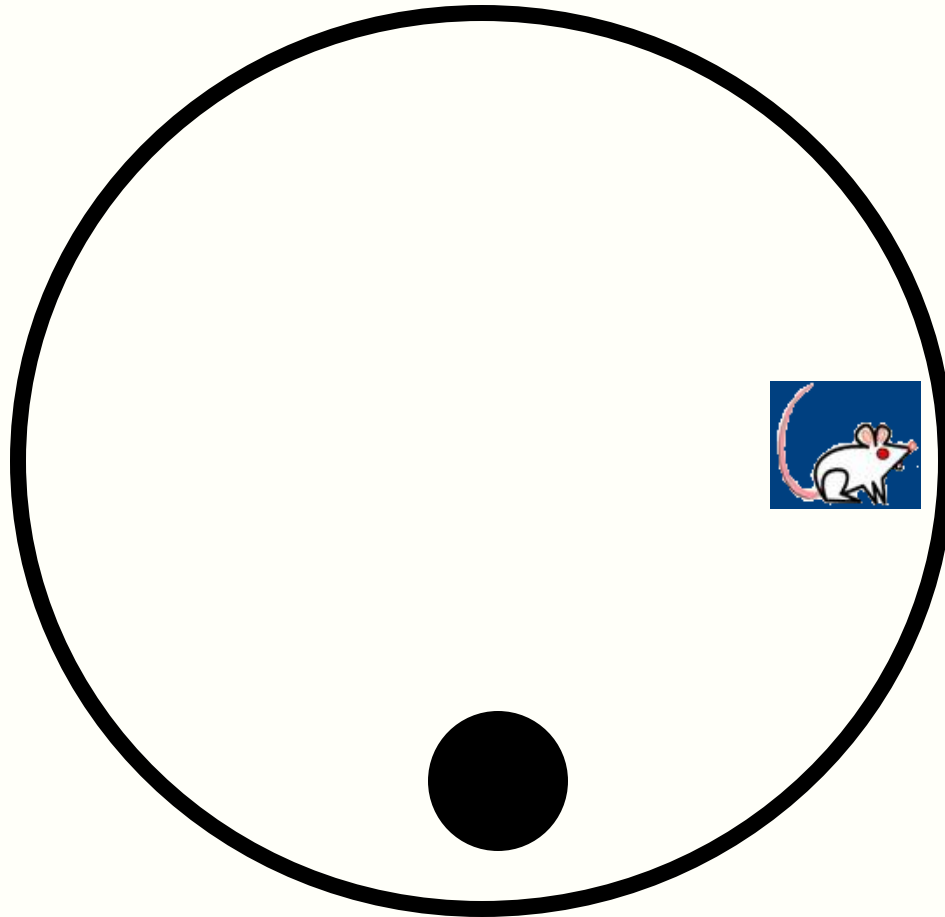
# Alcoholic rat



# Non-alcoholic rat

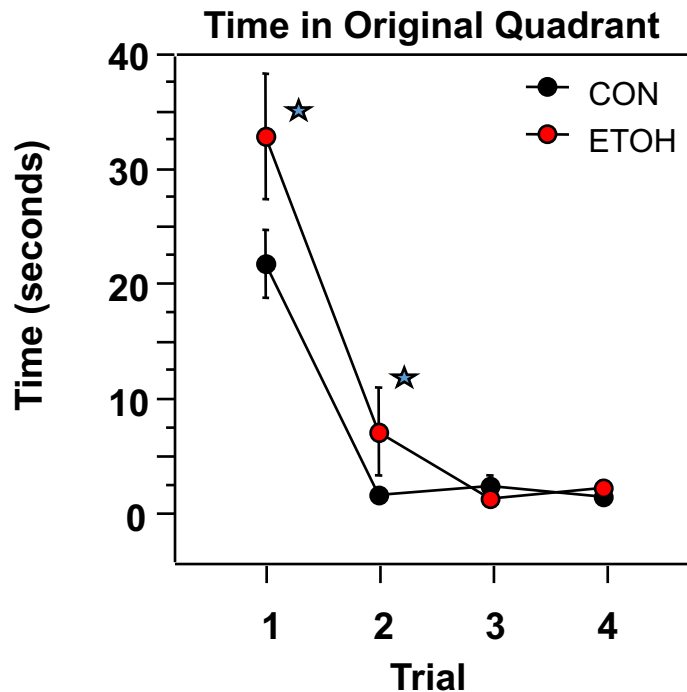


# Alcoholic rat

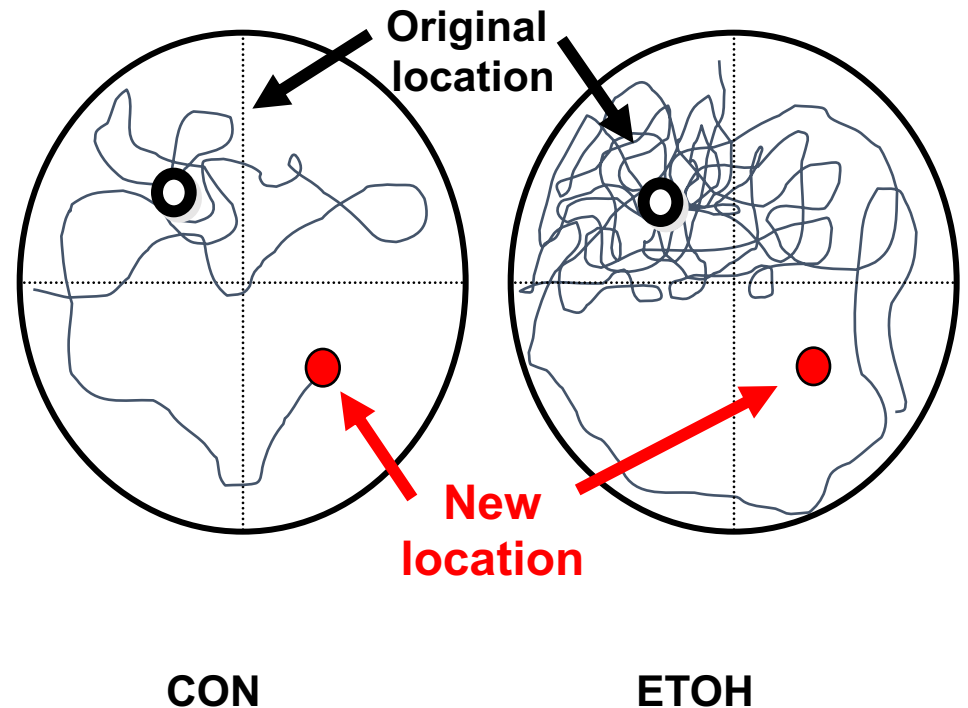


# Binge Ethanol treated animals have persistent reversal learning deficits.

Ethanol binge treatment of adolescent mice or rats results in persistent reductions in reversal learning, an indicator of disrupted frontal cortical and learning networks. Adolescent ethanol results in adult relearning deficits in both Morris water maze and Barnes spacial learning maze.

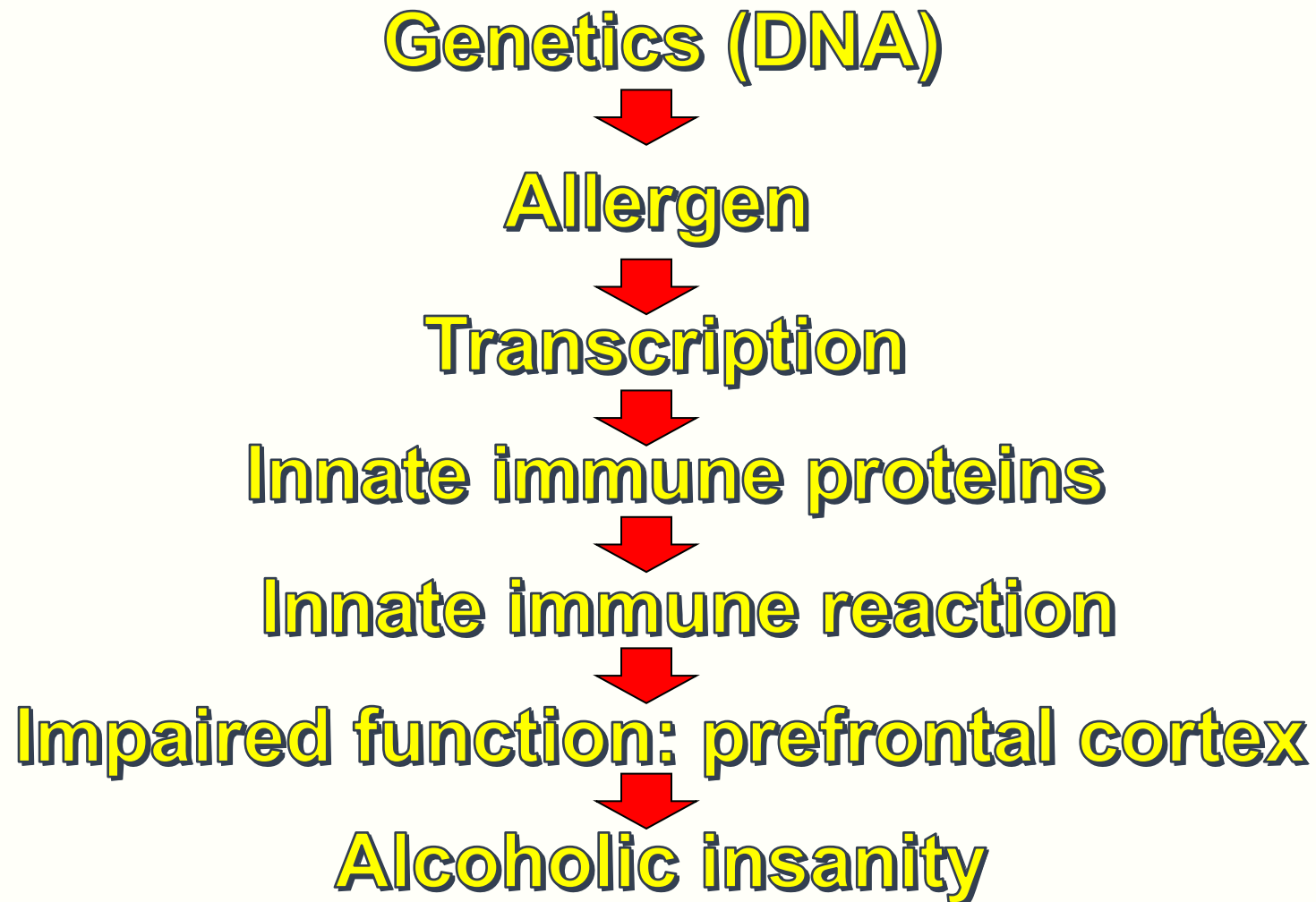


**Obernier and Crews, 2001**  
**Coleman and Crews, 2009**



Search path of rats. Open circle original platform-red circle new location. Binge ethanol treated rats perseverate on old location.

# Immune theory of addiction: Induction of innate immunity

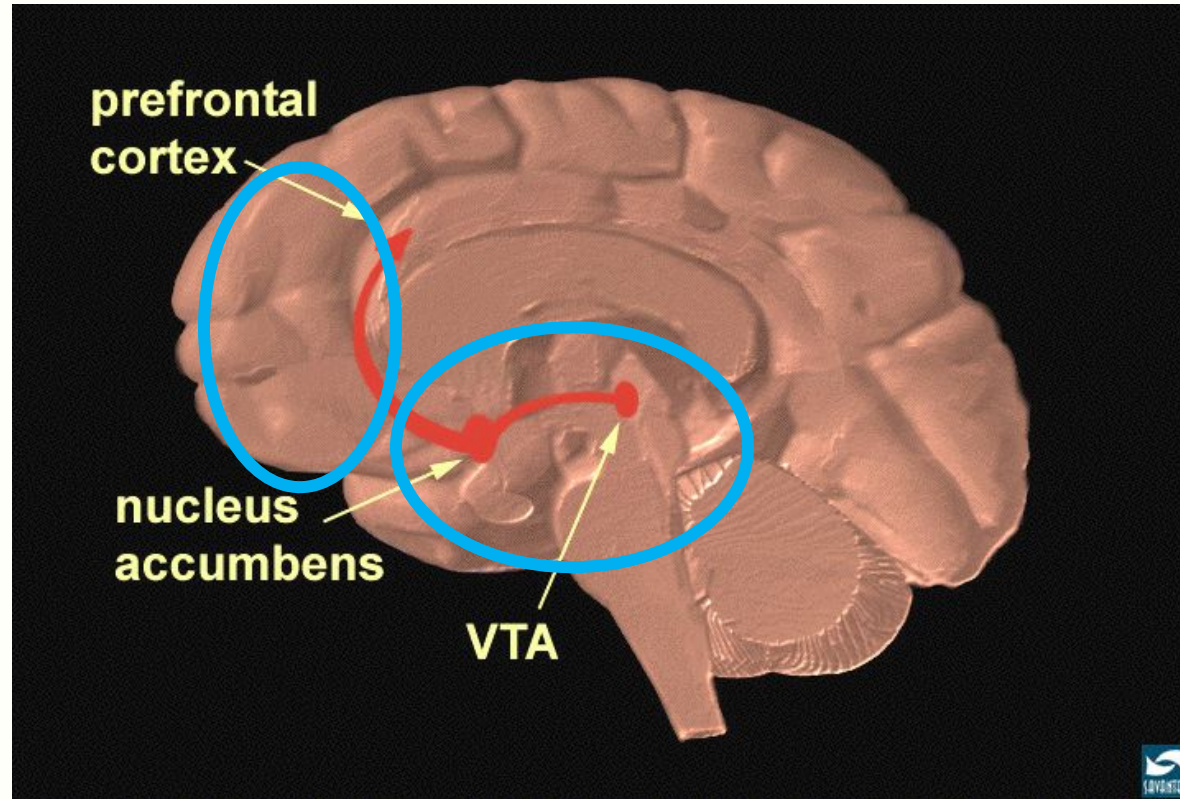




## **2. Neuroscience of cognitive dissonance**

# Formula of mature human behavior

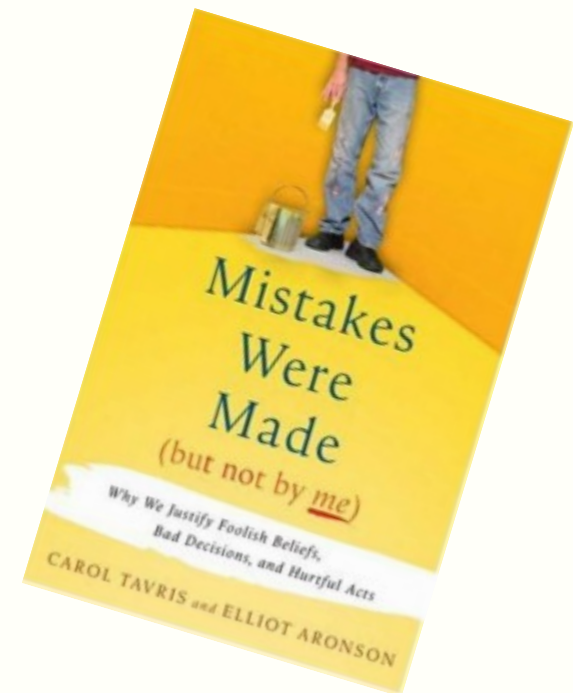
**F** (Feelings) + **T** (Thoughts) = **A** (Actions)



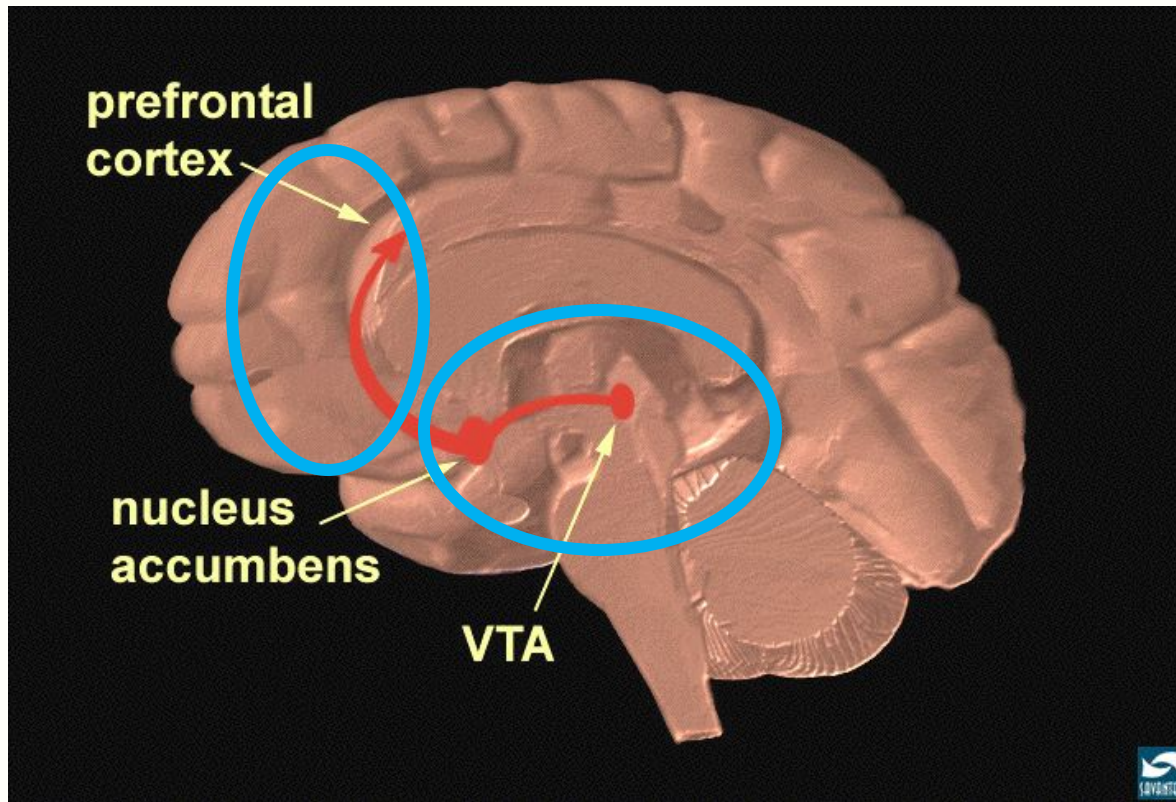
# Denial & cognitive dissonance

“Mistakes were made, but not by me: Why we justify foolish beliefs, bad decisions, and hurtful acts”

*Carol Tavris and Elliot Aronson*



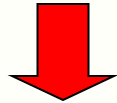
# Hierarchy of human behavior



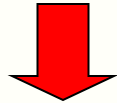
**Alcoholic denial resolves  
conflict caused by drinking  
too much**

# Addiction Cascade

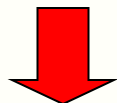
Drink



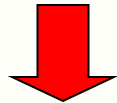
Drunk



"Trouble"

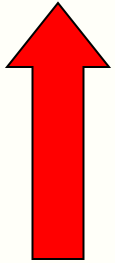


Abstain

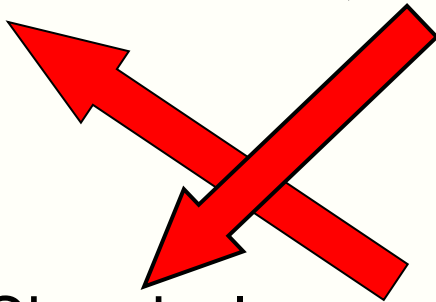


Urge to use

Use again



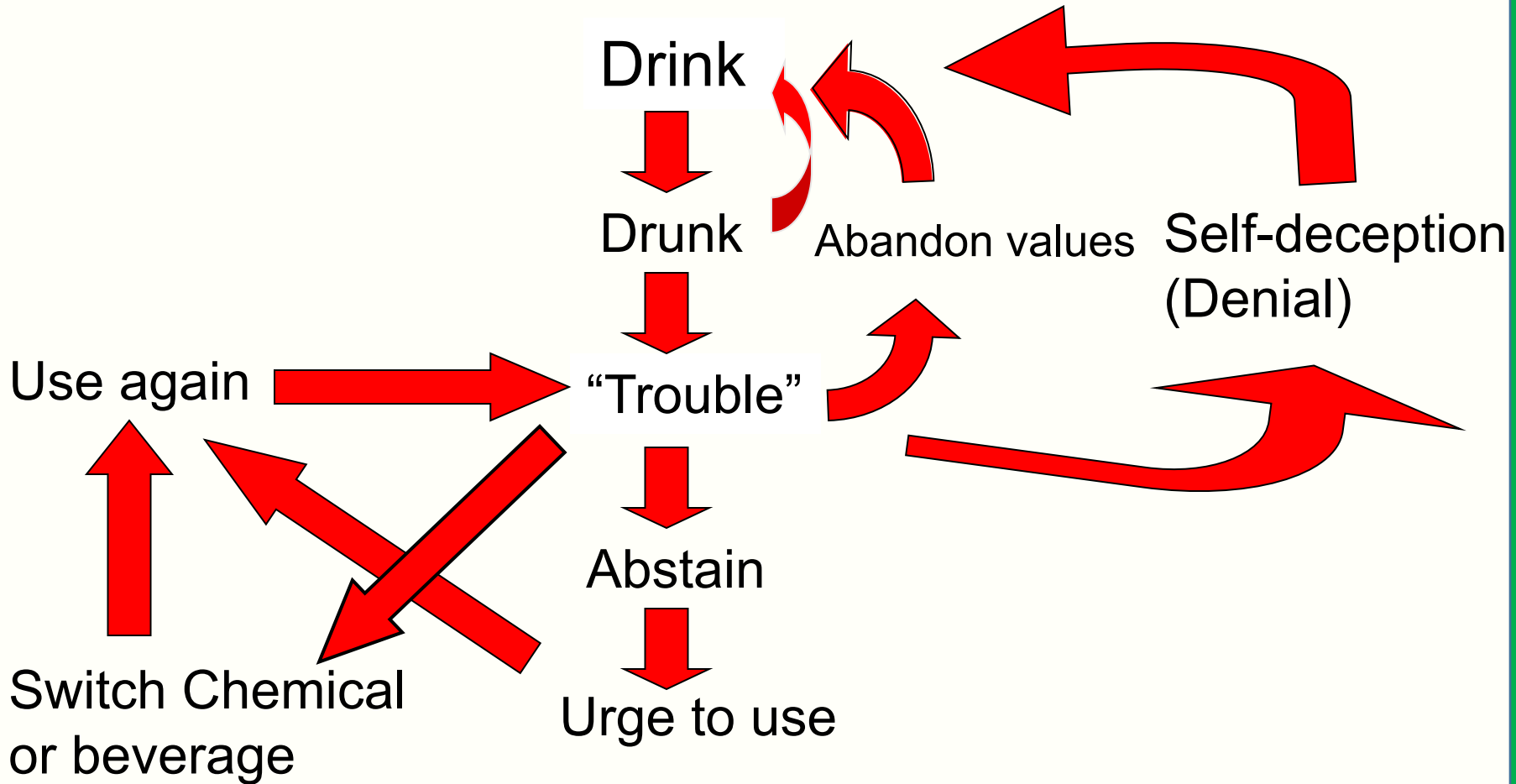
Switch Chemical  
or beverage



# Addiction Cascade

- Conflict between values and behavior
  - Drinking and drug use is causing harm
  - BUT
  - Drinking (or using drugs) is a need that must be satisfied
- =
- Cognitive dissonance
  - an uncomfortable feeling or stress caused by holding two contradictory ideas simultaneously

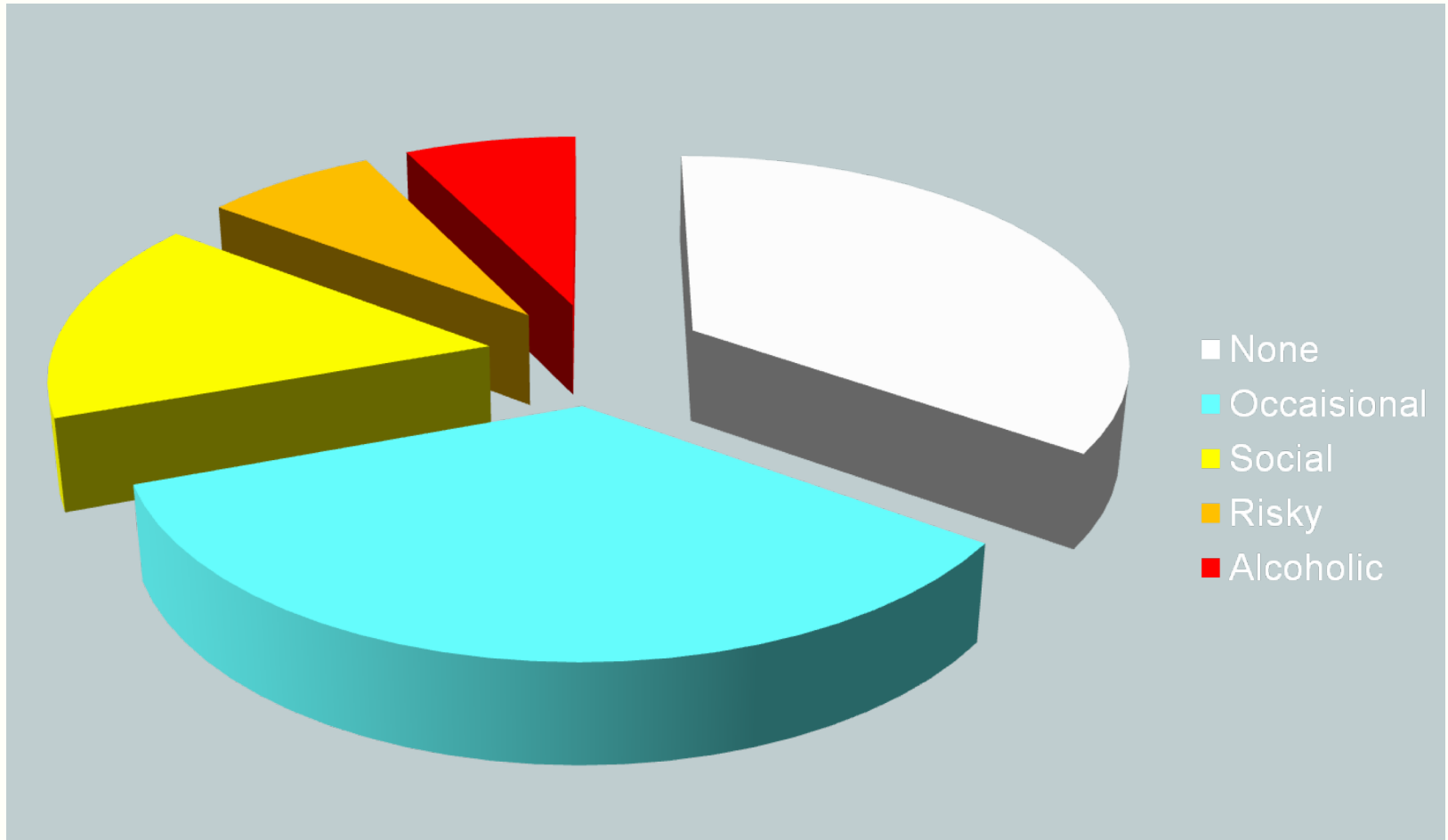
# Addiction Cascade





# **3. Science of readiness**

# Identifying the problem: Drinking in America



# Motivational Readiness

Maintenance (Steps 10-12)

**85%**

Action (Steps 4-9)

Preparation (Steps 1,2 &3)

Contemplation

Precontemplation

# **4. Neuroplasticity**

# Neuroplasticity:

- The capacity of neuronal substance to change in response to environment and experience
- “Psychic change”



# **Types of neuroplasticity**

- Negative (brain impairment)
- Positive (brain healing)
  
- Adding connections
- Removing connections (pruning)
- Sensitizing connections
- Desensitizing connections
- Adding neurons (neurogenesis)

# Heal Your Brain

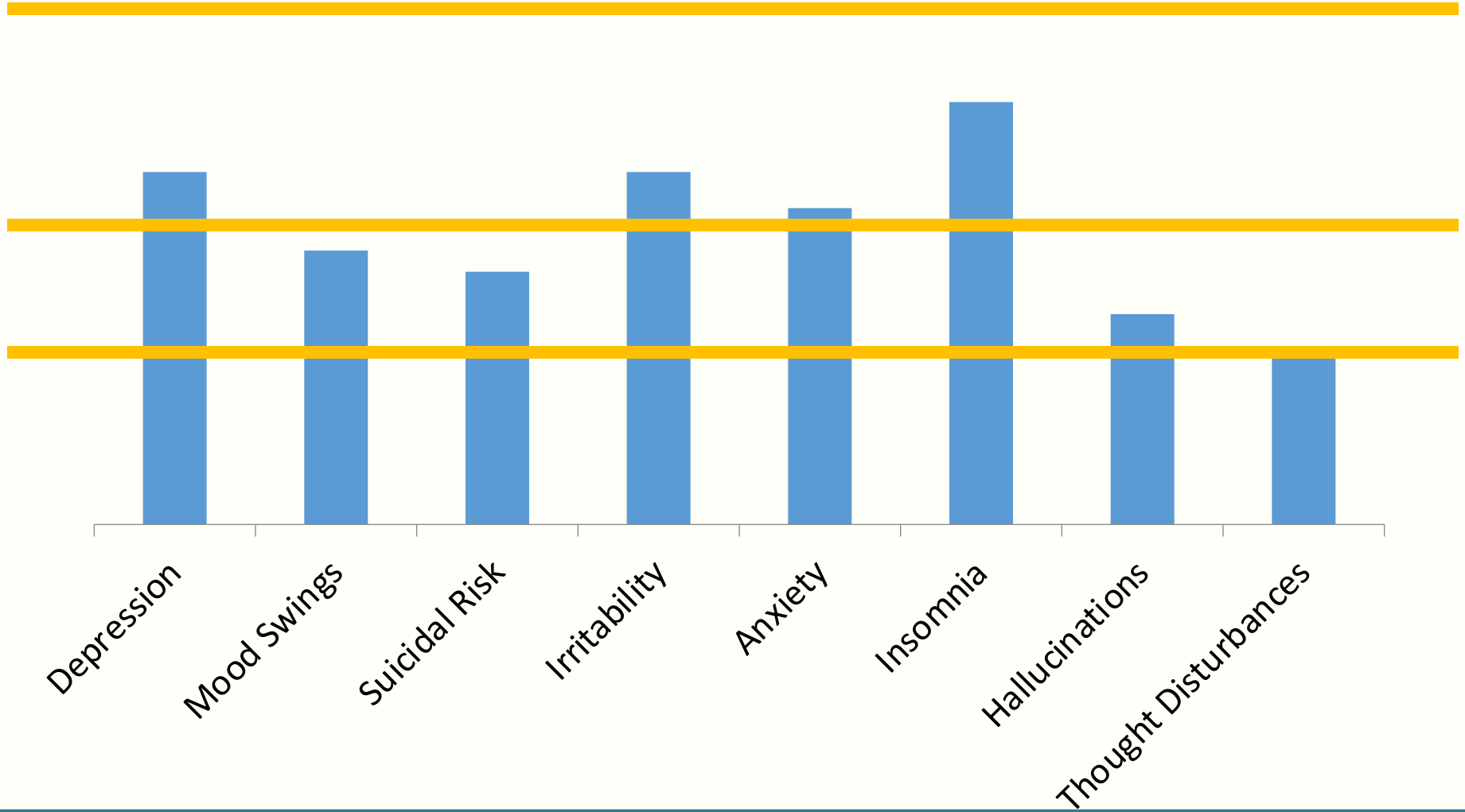
- Thoughts & actions remold brain:
  - Spur new neurons
  - Create new connections; prune old
  - Restore neurotransmitter function
  - Restore frontal lobe (exec brain) relationship with limbic brain (primitive) -> better decisions, behavior

**Drain the Swamp and see the stumps: Clinical correlation of recent addiction neuroscience and psychiatric co-morbidity**



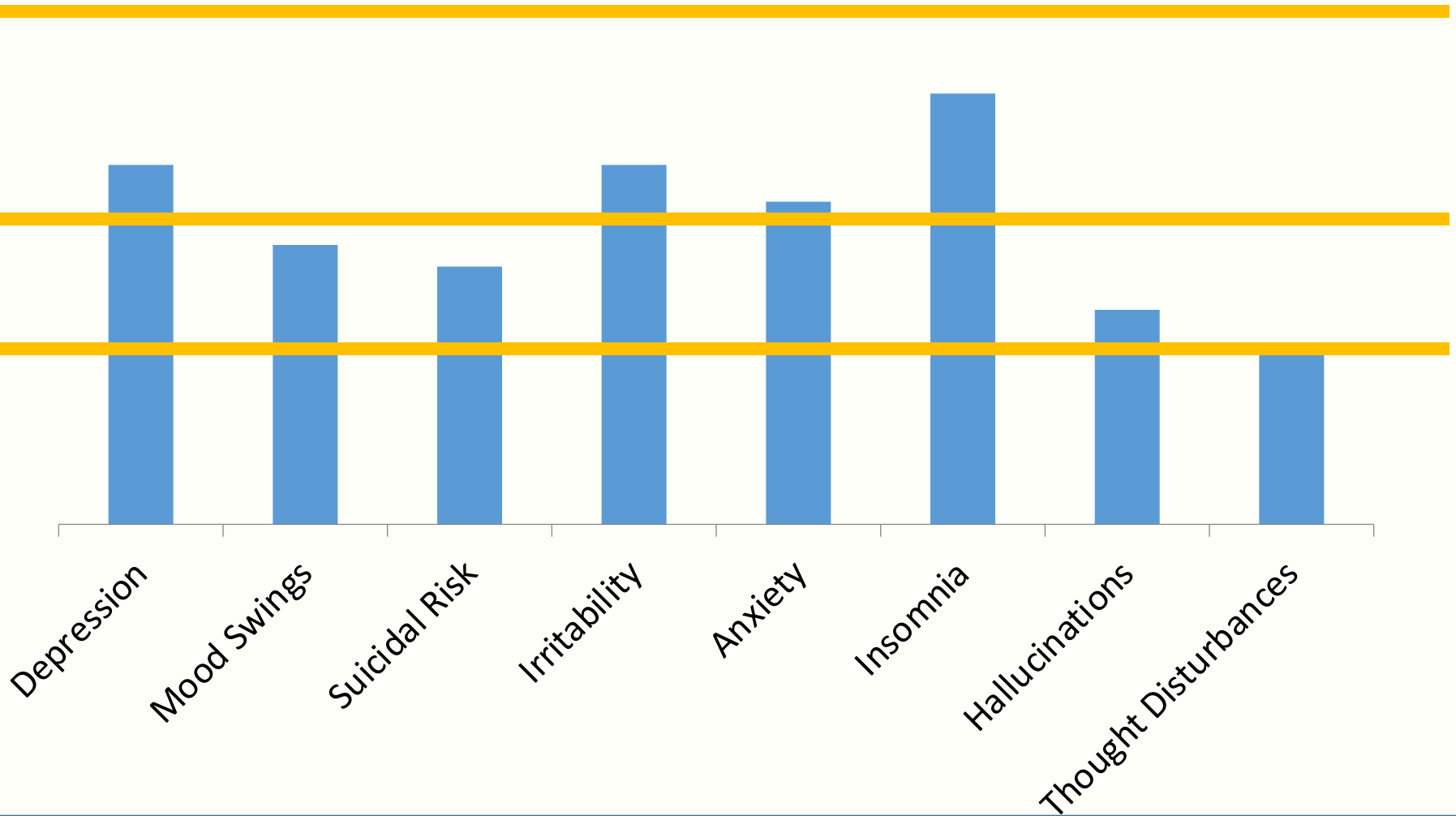


# Stress, fatigue, sleep and sensory deprivation etc. lower threshold for latent emotional symptoms



# Impact of threshold changes of addiction on mental co-morbidity

(binge drinking and induction of innate immune genes create co-morbidity)  
(and neuroplasticity of recovery helps resolve it)



---

DIAGNOSTIC AND STATISTICAL  
MANUAL OF  
MENTAL DISORDERS

FIFTH EDITION

DSM-5

---

AMERICAN PSYCHIATRIC ASSOCIATION

# DSM5 exclusionary criteria

## ➤ Major Depressive Disorder:

- C. The episode is not attributable to the physiological effects of a substance or to another medical condition.

## ➤ Bipolar I Disorder:

- D. The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication, other treatment) or to another medical condition.

**Note:** A full manic episode that emerges during antidepressant treatment (e.g., medication, electroconvulsive therapy) but persists at a fully syndromal level beyond the physiological effect of that treatment is sufficient evidence for a manic episode and therefore, a bipolar I diagnosis.

## ➤ Bipolar II Disorder:

- F. The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication or other treatment).

# DSM5 exclusionary criteria

- **Obsessive Compulsive Disorder:**

- C. The obsessive-compulsive symptoms are not attributable to the physiological effect of a substance (e.g., a drug of abuse, a medication) or another medical condition.

- **Anxiety Disorder:**

- E. The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism).

- **Schizophrenia**

- E. The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition.

- **Personality Disorder:**

- F. The enduring pattern is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., head trauma).

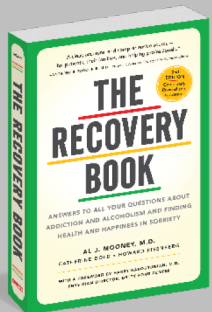
# 5. Recovery Zone System

<http://bit.ly/recoveryzones>



# The Recovery Zone System

- Three Recovery Zones; blueprint for life
  - 1) **Red Zone: Stop.**  
**Activate your recovery.**
  - 2) **Yellow Zone: Proceed with caution.**  
**Build or rebuild your life.**
  - 3) **Green Zone: Go.**  
**Celebrate your life.**



# Recovery Zone System

## •The Recovery Zones

- Red - Activate
- Yellow - Build
- Green - Celebrate

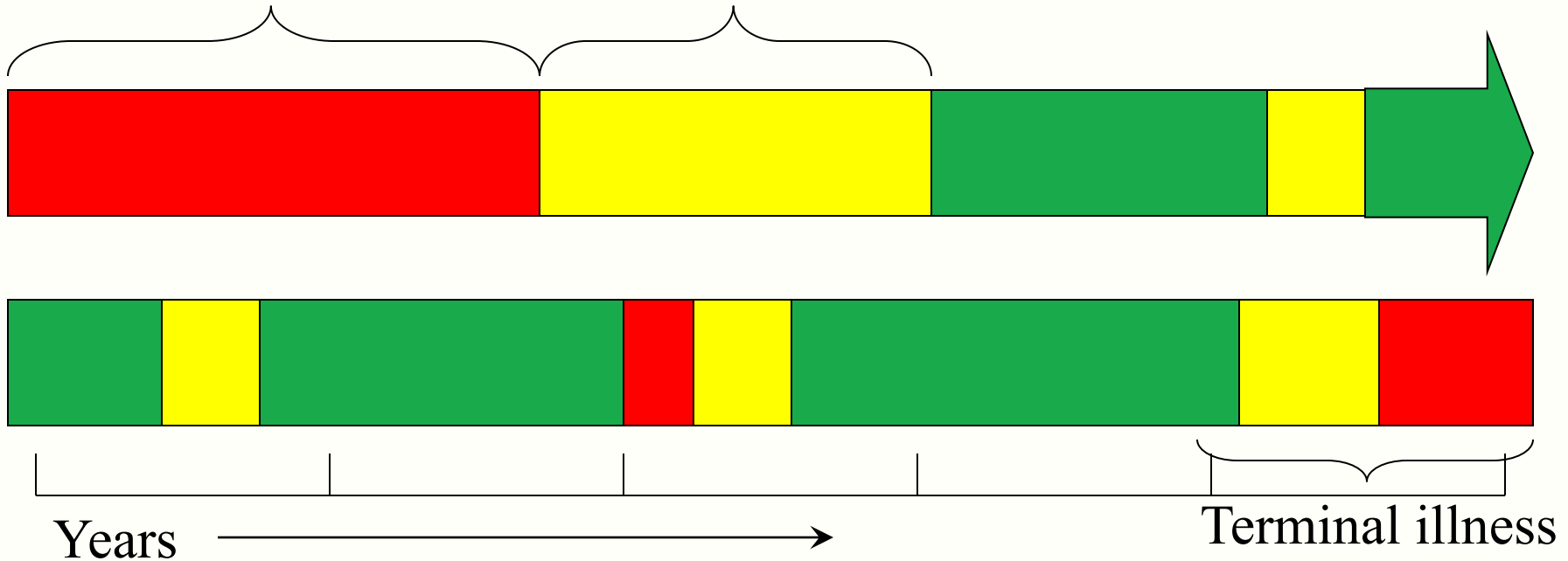
## •Recovery Zone ReCheck

## •TAMERS



# Zones in the recovery timeline

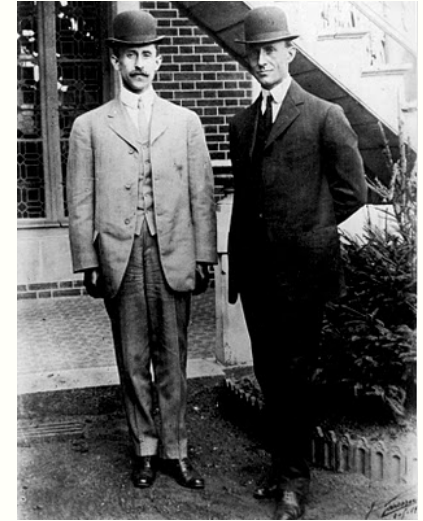
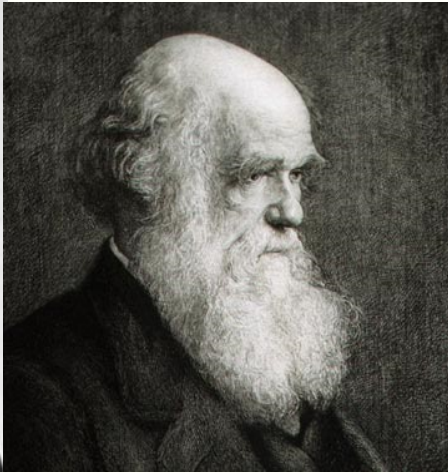
Activate recovery    Build life to capacity



# TAMERS

- **Think about recovery, Talk about recovery**
- **Act on recovery, connect with others**
- **Meditate and Minimize stress**
- **Exercise and Eat well**
- **Relax**
- **Sleep**

# Overcoming Barriers to Scientific Progress





# THE RECOVERY BOOK

Al J. Mooney MD  
509 Midenhall Way  
Cary, NC 27513  
Mobile: 919 523 0569

Email: [amooney@aol.com](mailto:amooney@aol.com)

<http://bit.ly/CornerstoneHIMS2019>

