

The Role of

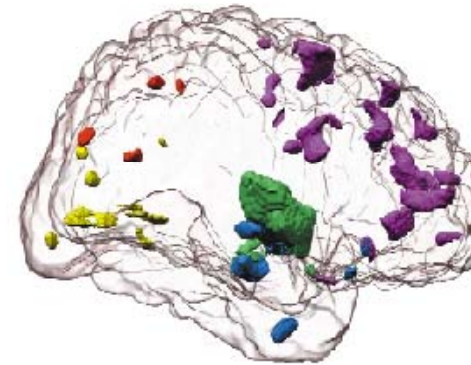
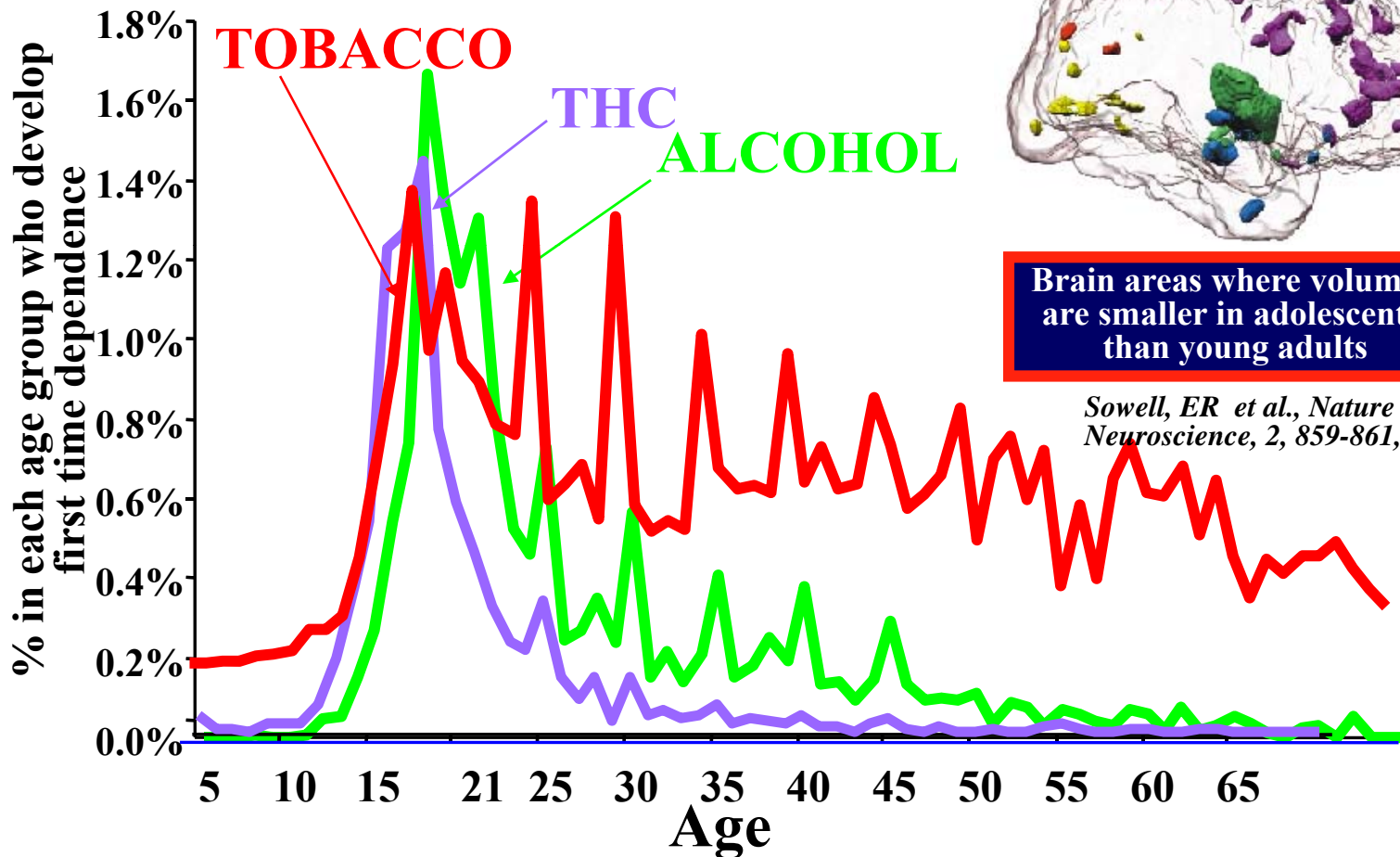
Research in Global Drug Policy



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Director, National Institute on Drug Abuse
National Institutes of Health



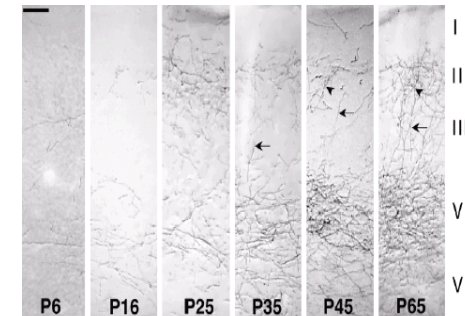
ADDICTION IS A **DEVELOPMENTAL DISEASE** *starts in adolescence and childhood*



Brain areas where volumes are smaller in adolescents than young adults

Sowell, ER et al., Nature Neuroscience, 2, 859-861, 1999

Amygdalofugal fibers in mPFC



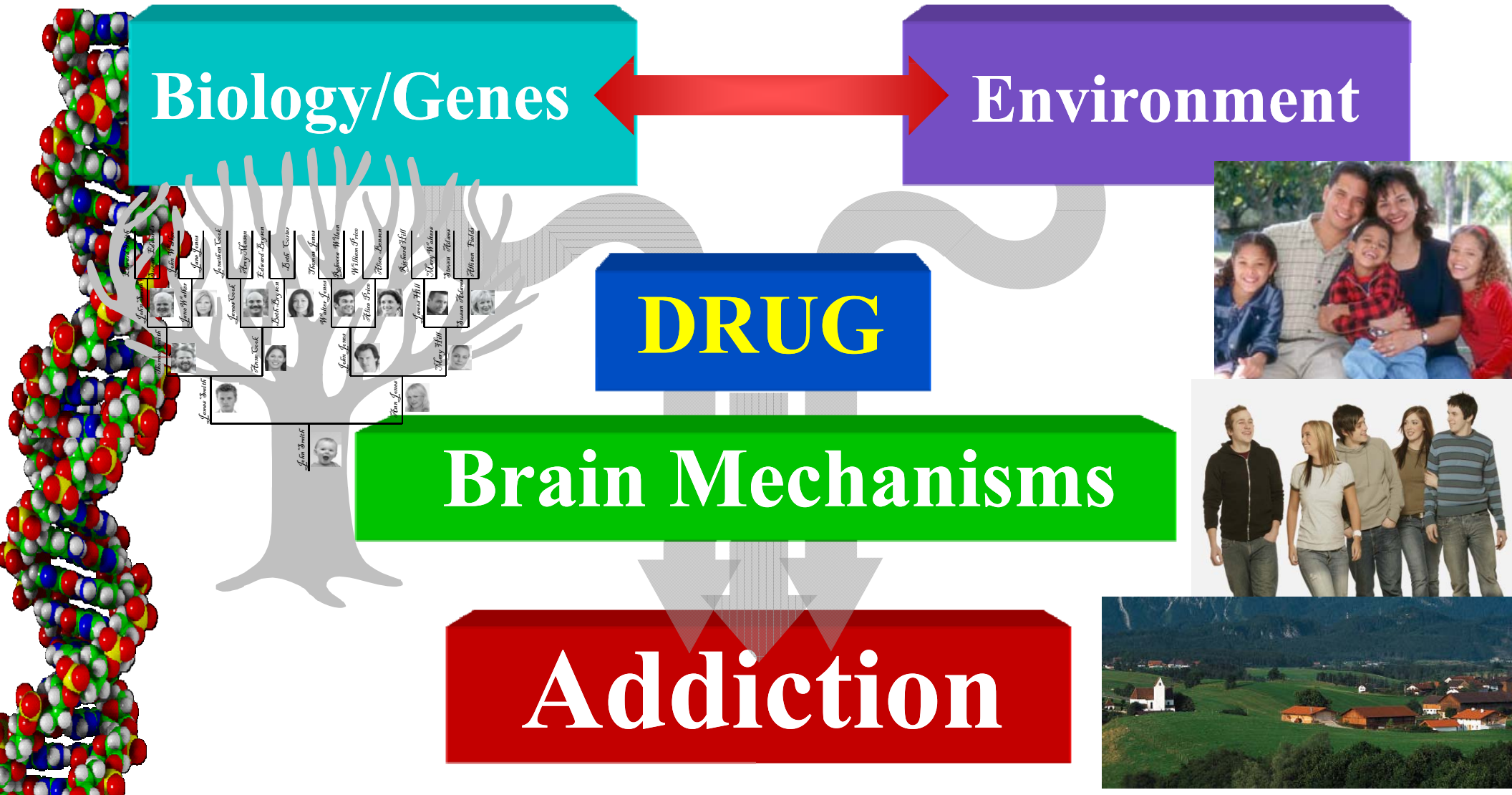
Amygdalo frontal connections are not fully developed until adulthood

Cunningham, M et al., J Comp Neurol 453, 116-130, 2002.

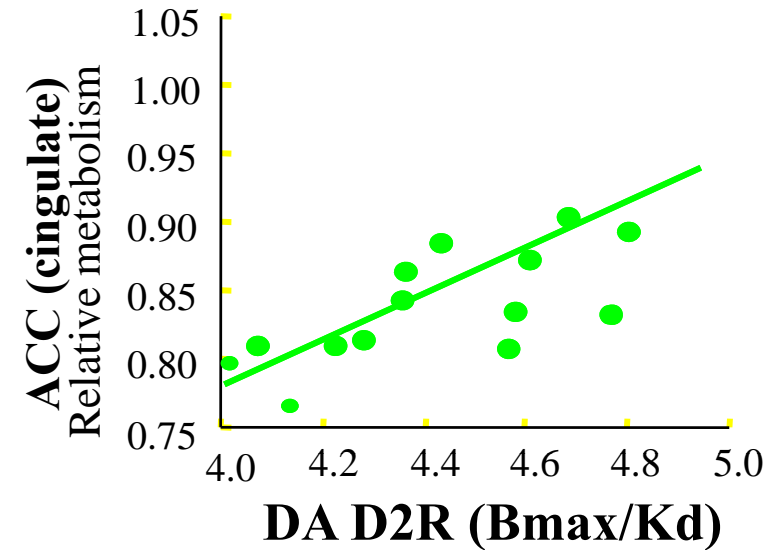
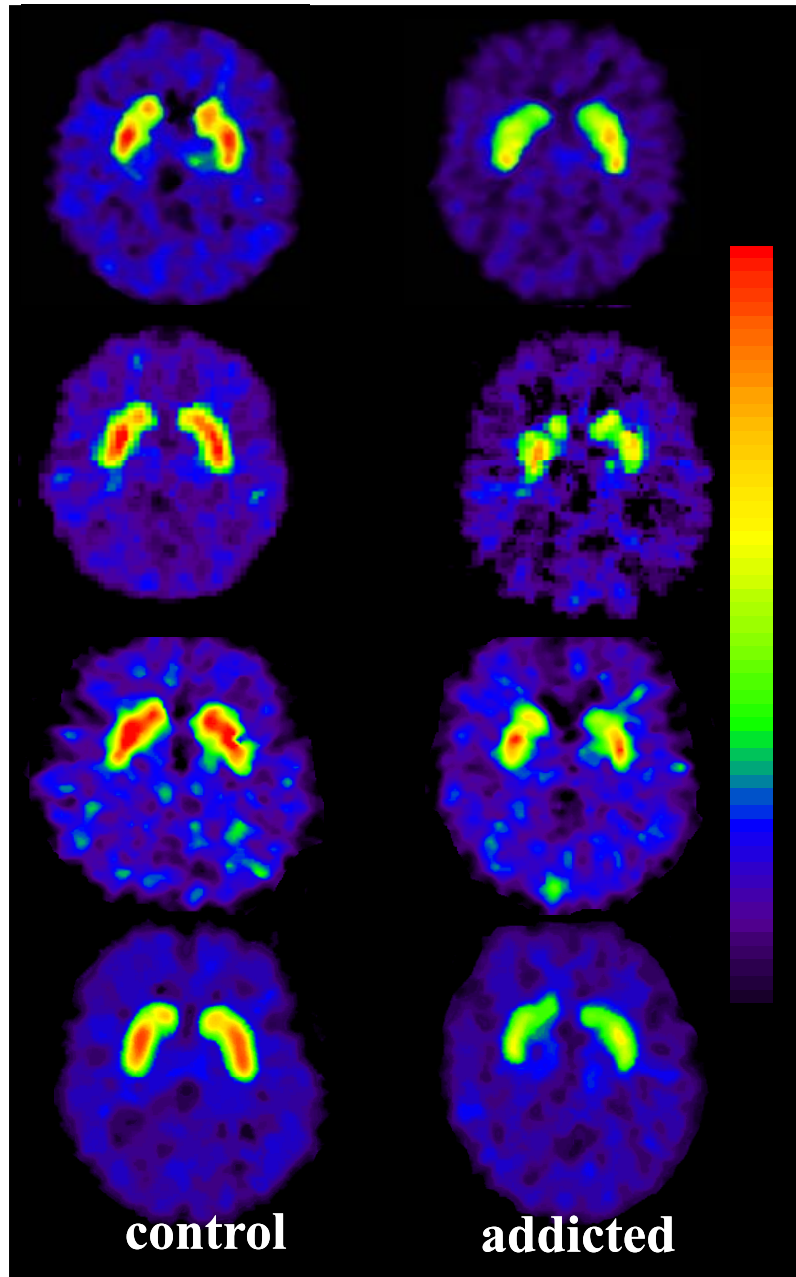
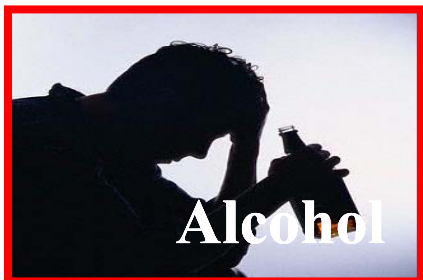
Age at **tobacco, at **alcohol** and at **cannabis** dependence as per DSM IV**

NIAAA National Epidemiologic Survey on Alcohol and Related Conditions, 2003.

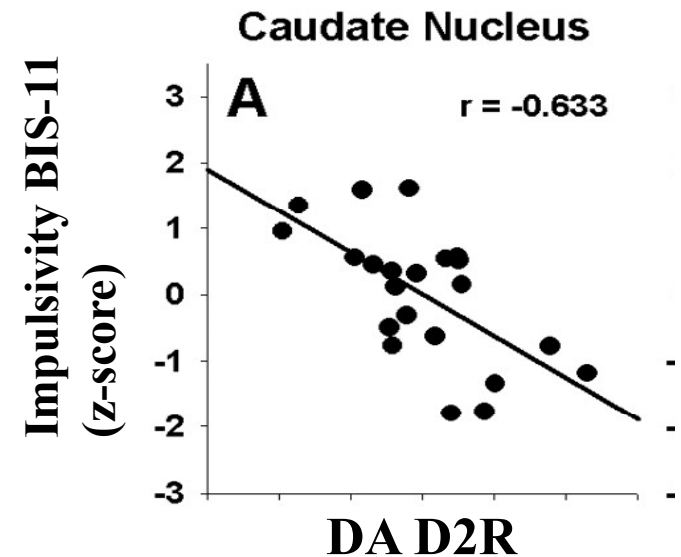
ADDICTION INVOLVES **MULTIPLE FACTORS**



Dopamine D2 Receptors are Lower in Addiction



Volkow et al. Arch Gen Psychiat. 2006.



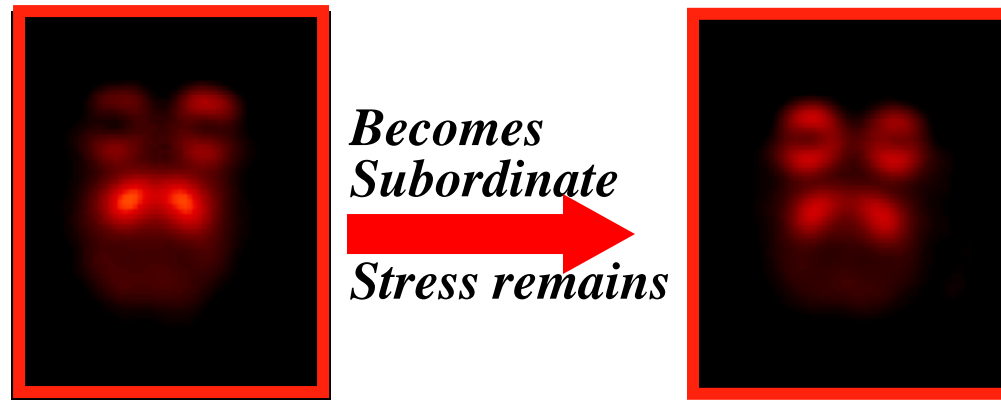
Lee et al. J. Neurosci. 2009.

Volkow et al., 2002.

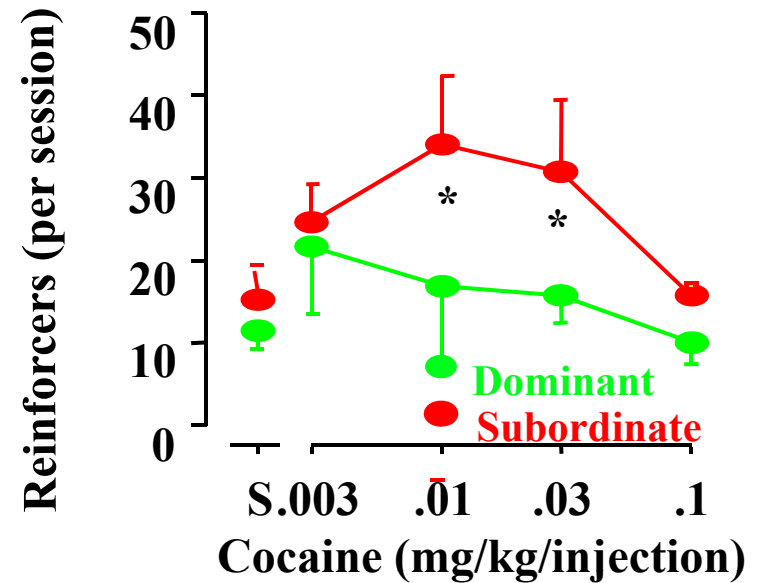
Effects of a Social Stressor on Brain DA D2 Receptors and Propensity to Administer Drugs



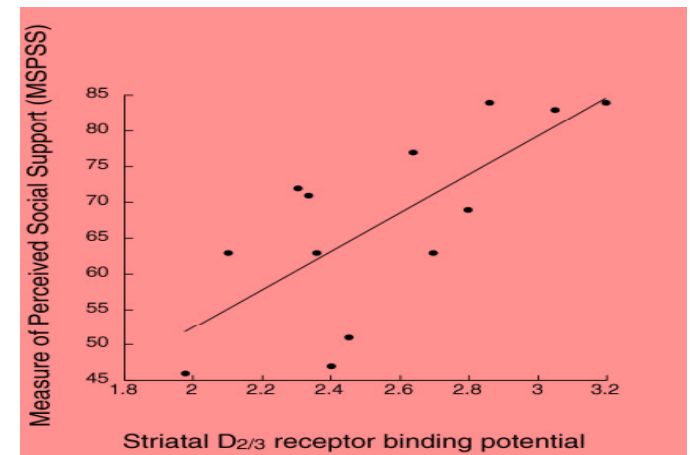
Isolation Can Change Neurobiology



Morgan, D. et al. *Nature Neuroscience*, 5: 169-174, 2002.

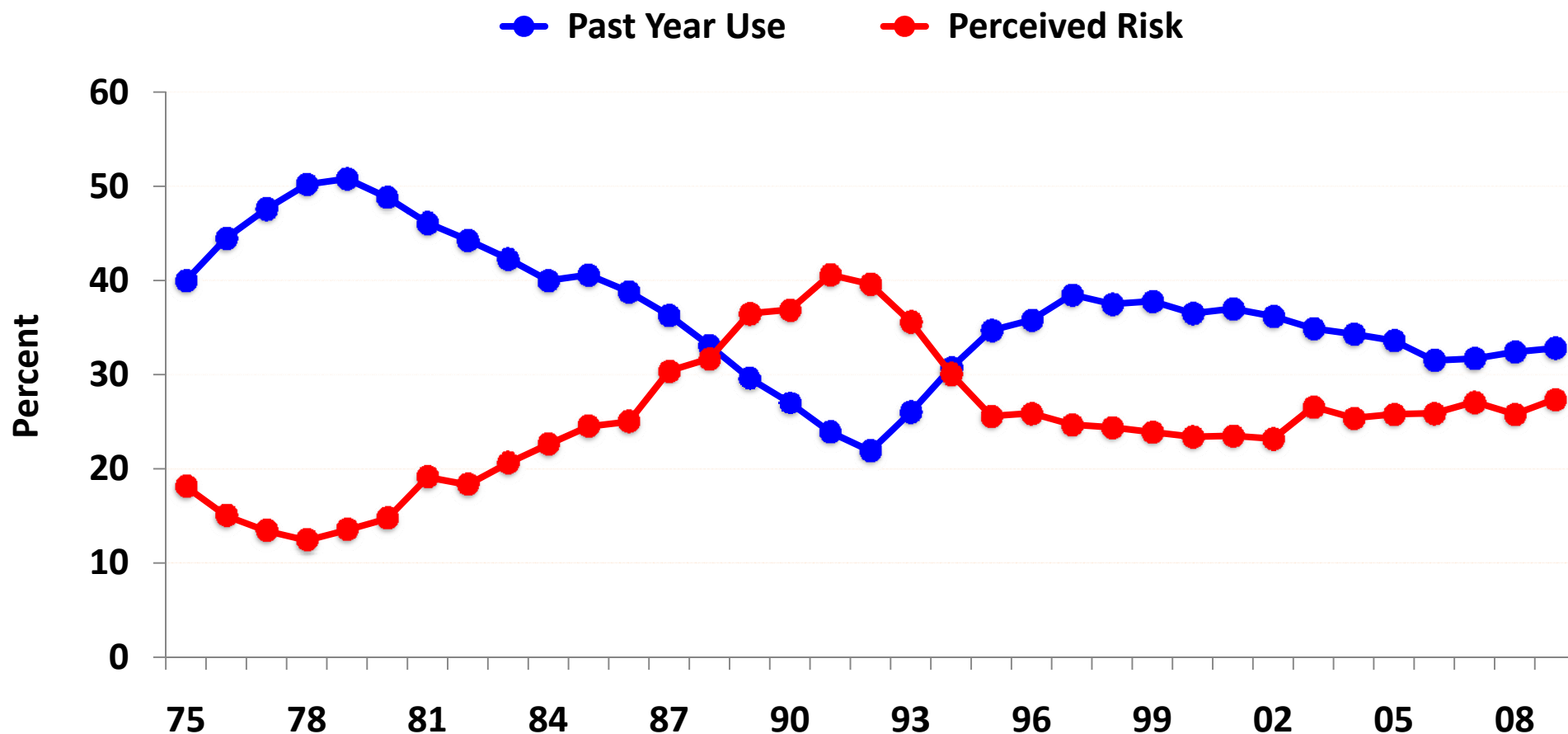


Social Support Is Correlated with D2/3 Receptor Binding



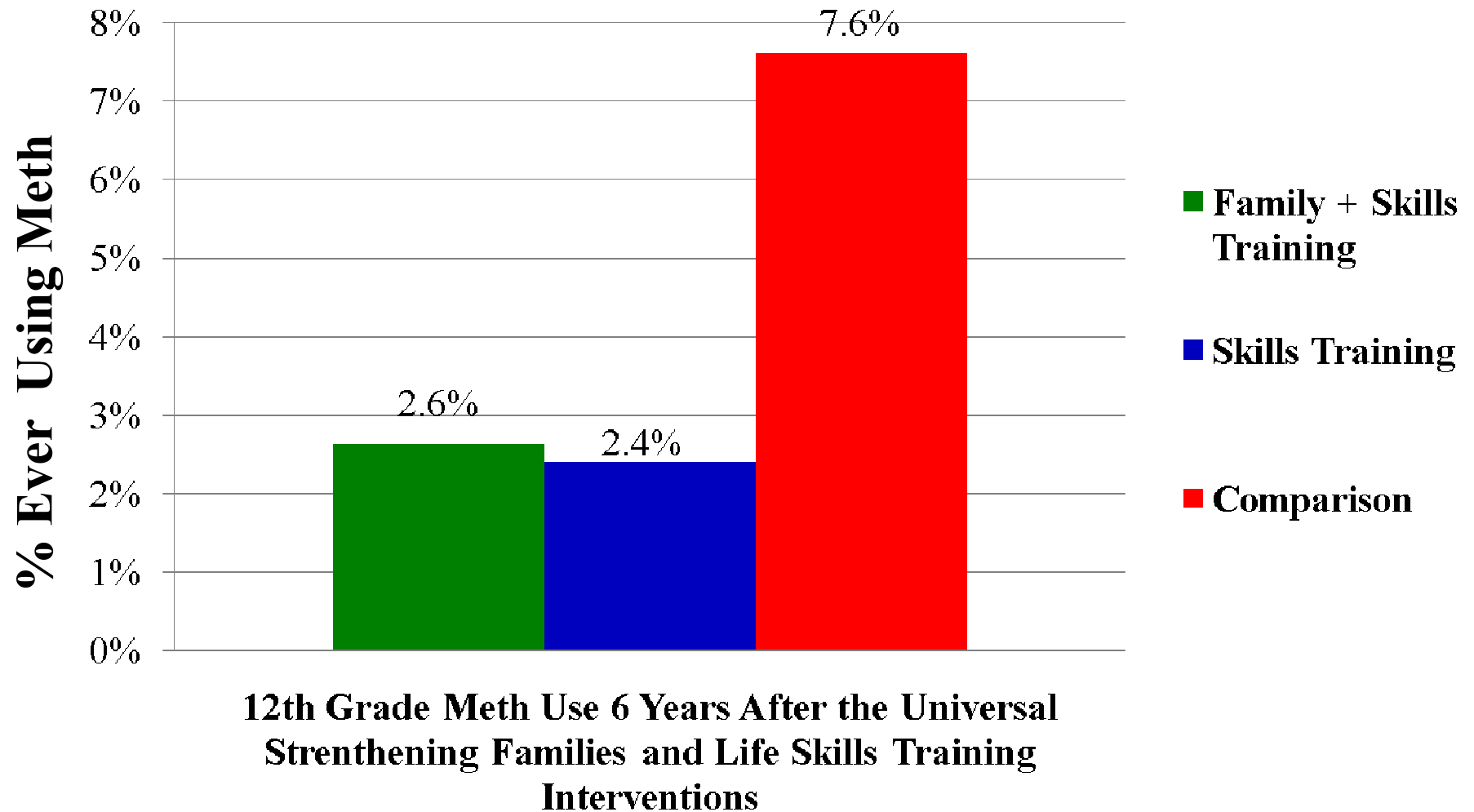
Martinez D. et al., *Bio Psychiatry* 2010.

Changes in Attitude Lead to Changes in Marijuana Use (12th Graders)



Source: *The Monitoring the Future study, the University of Michigan*

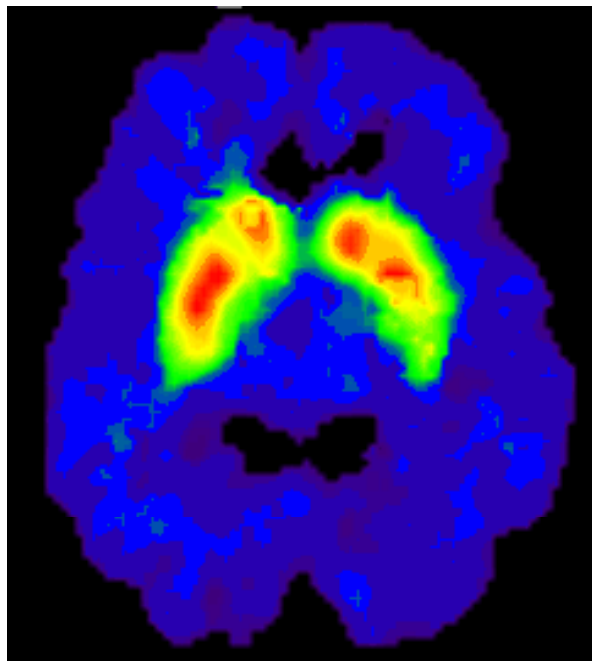
Prevention Programs Work



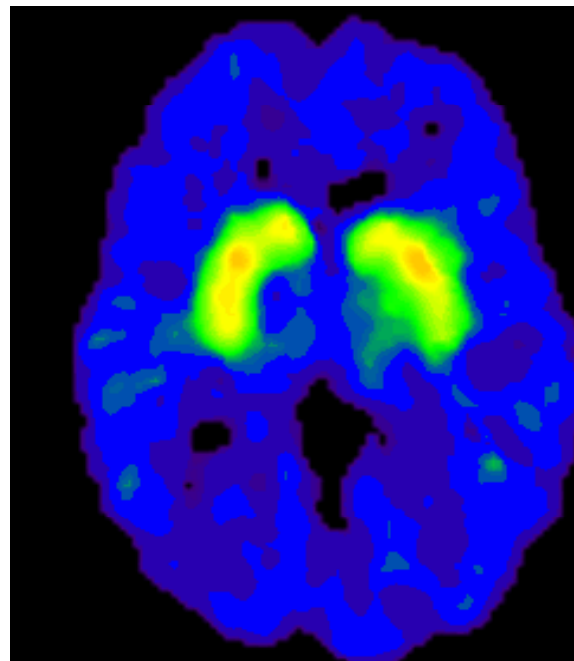
Source: Spoth, et al. Arch Pediatr Adolesc Med. 2006;160:876-882.

ADDICTION **CAN BE TREATED**

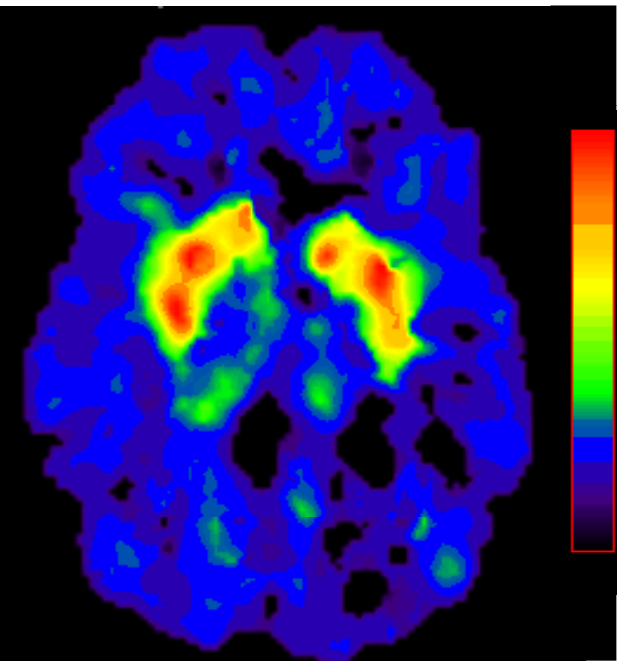
Partial Recovery of Brain Dopamine Transporters in Methamphetamine (METH) Abuser After Protracted Abstinence



Normal Control



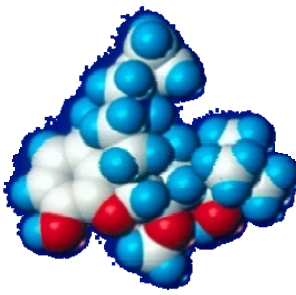
METH Abuser
(1 month detox)



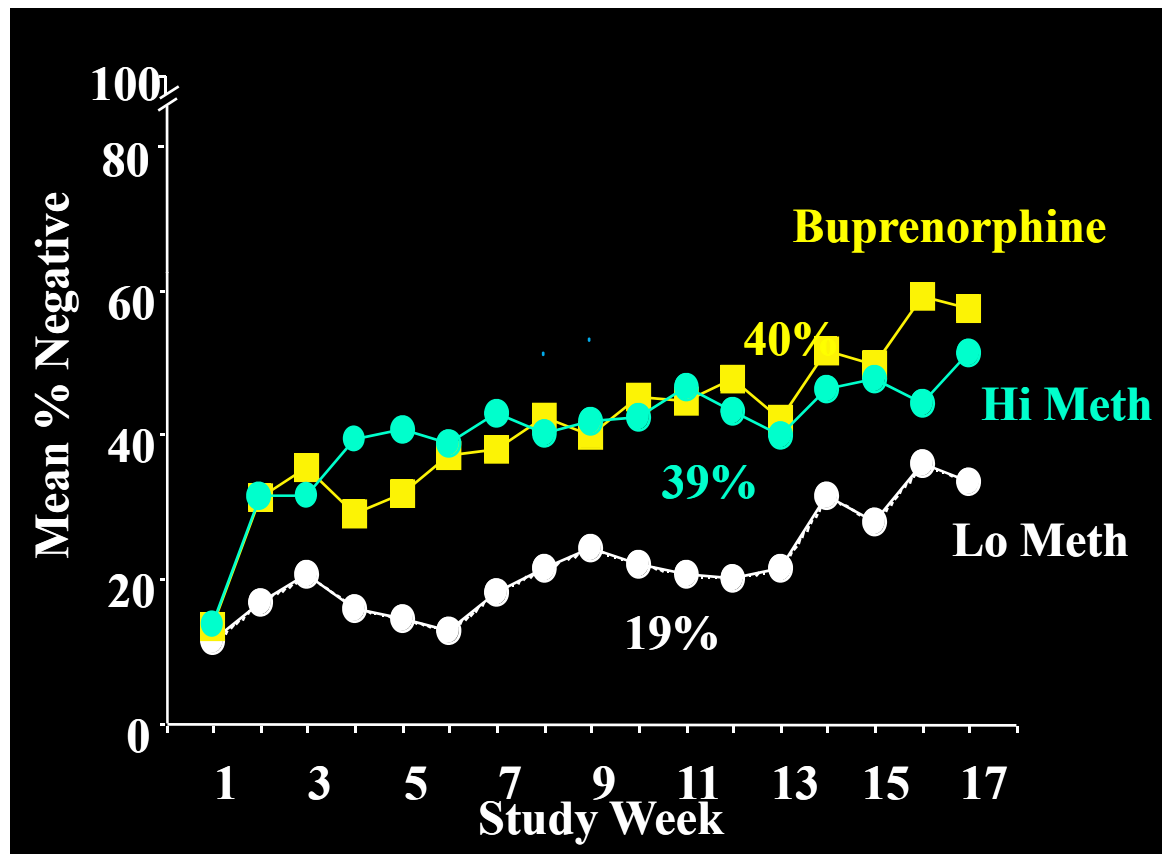
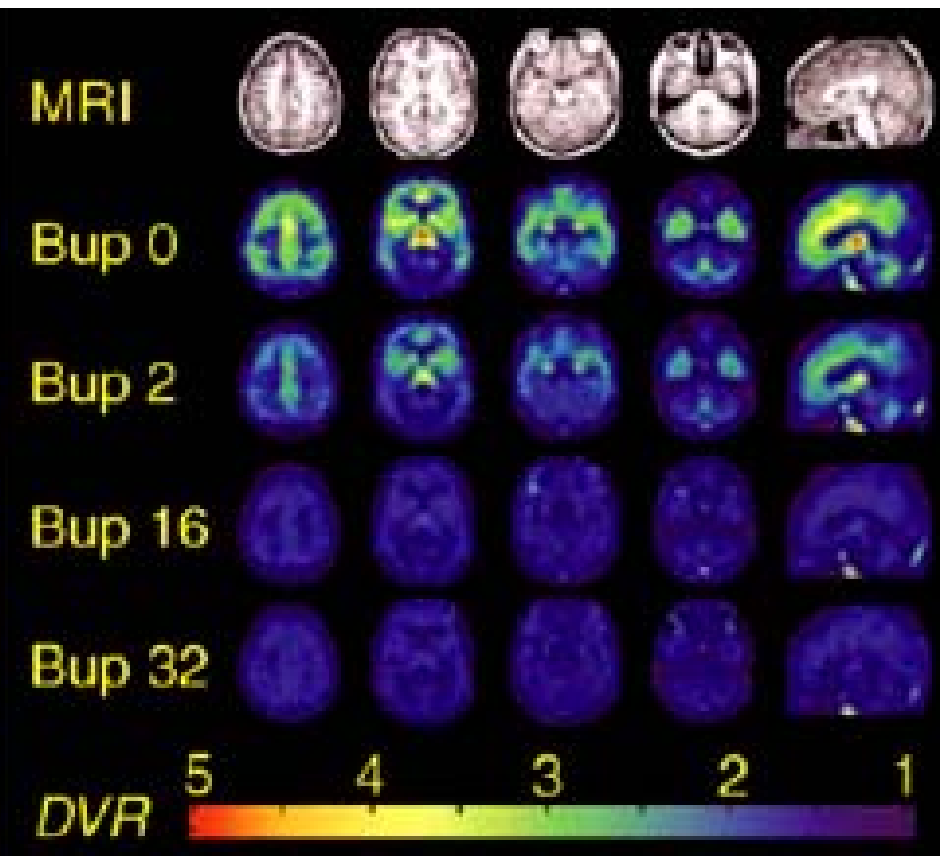
METH Abuser
(14 months detox)

Source: Volkow, ND et al., *Journal of Neuroscience* 21, 9414-9418, 2001.

Effects of Buprenorphine Maintenance Dose on μ -Opioid Receptor Availability



Opioid Urine Results for Buprenorphine and Methadone



Source: Greenwald, MK et al., *Neuropsychopharmacology* 2003;28: 2000-2009.

Source: Adapted from Johnson, et al., 2000.

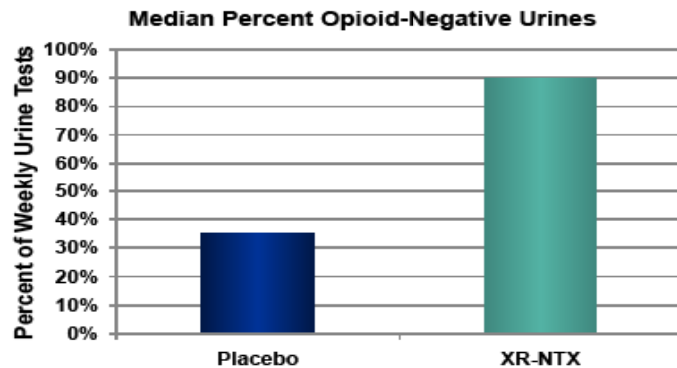
Future Research

Long-Acting Injectable Medications (i.e., Depot Naltrexone)

XR-NTX: Positive Phase 3 Results
Opioid Dependence

Primary Endpoint	
Rates of opioid-free urine tests	P=0.0002

■ Placebo: N=124
■ XR-NTX: N=126



IM Injection
every 4 weeks
for 24 weeks

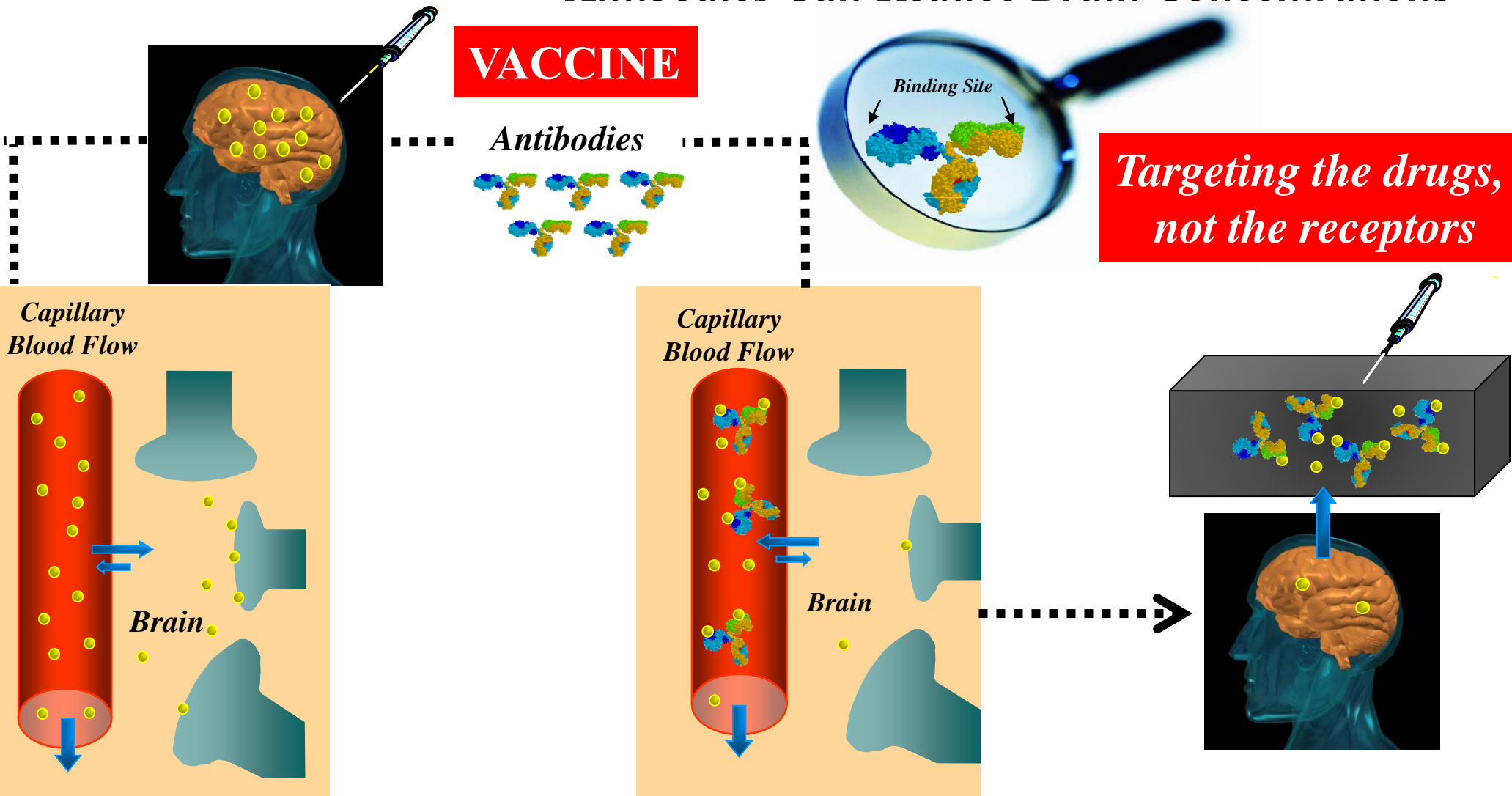
Secondary Endpoints: XR-NTX vs. Placebo	
Improved study retention during 6-month study period	P=0.004
Lower opioid craving scores	P<0.001
Less incidence of relapse to physiologic opioid dependence	P=0.017
Less self-reported opioid use	P=0.003

*Krupitzky et al.,
unpublished*

Future Research

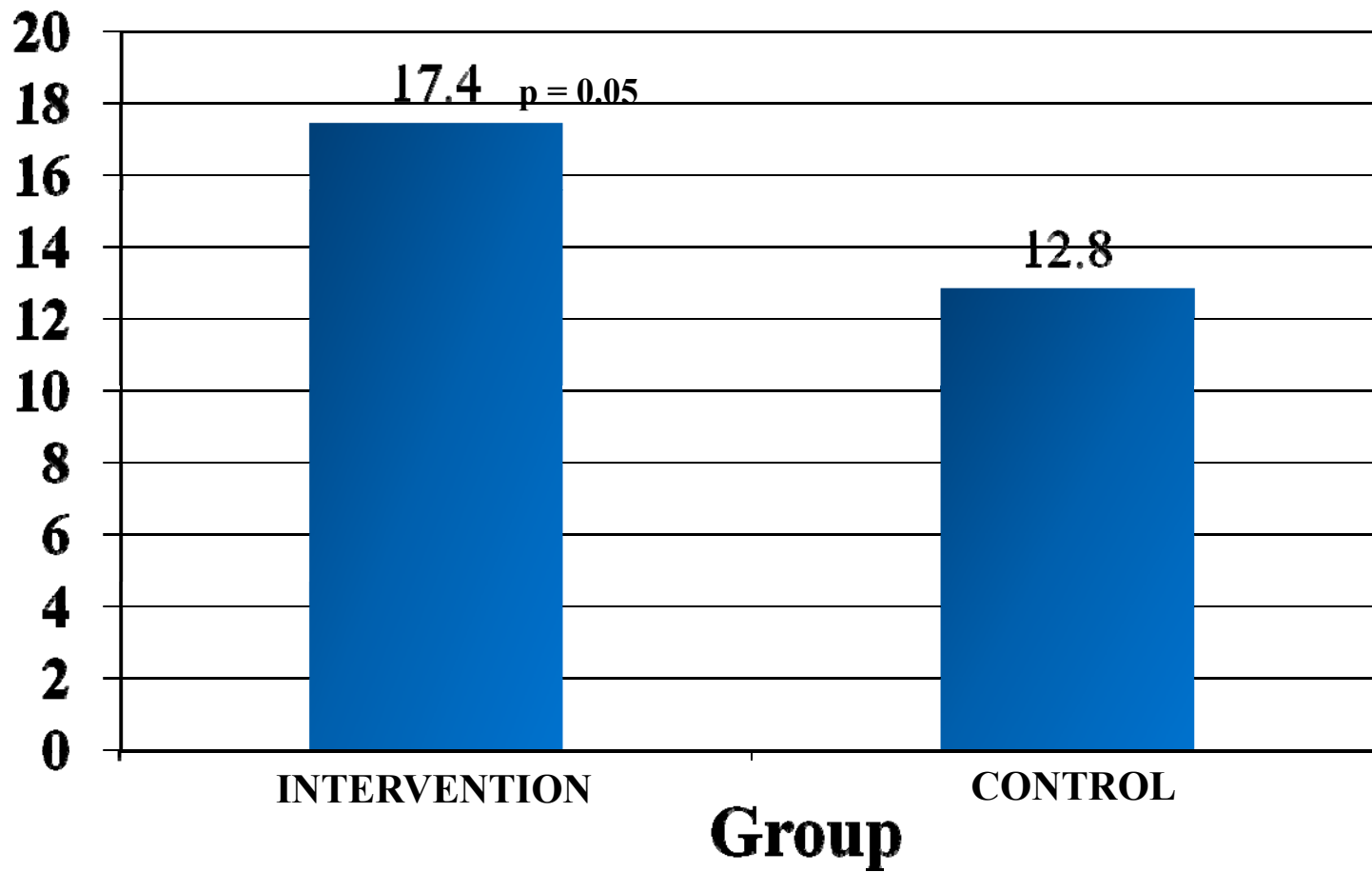
Immunotherapies for Addiction Treatment (i.e., Vaccines)

Antibodies Can Reduce Brain Concentrations



Screening and Brief Intervention in A Primary Care Setting

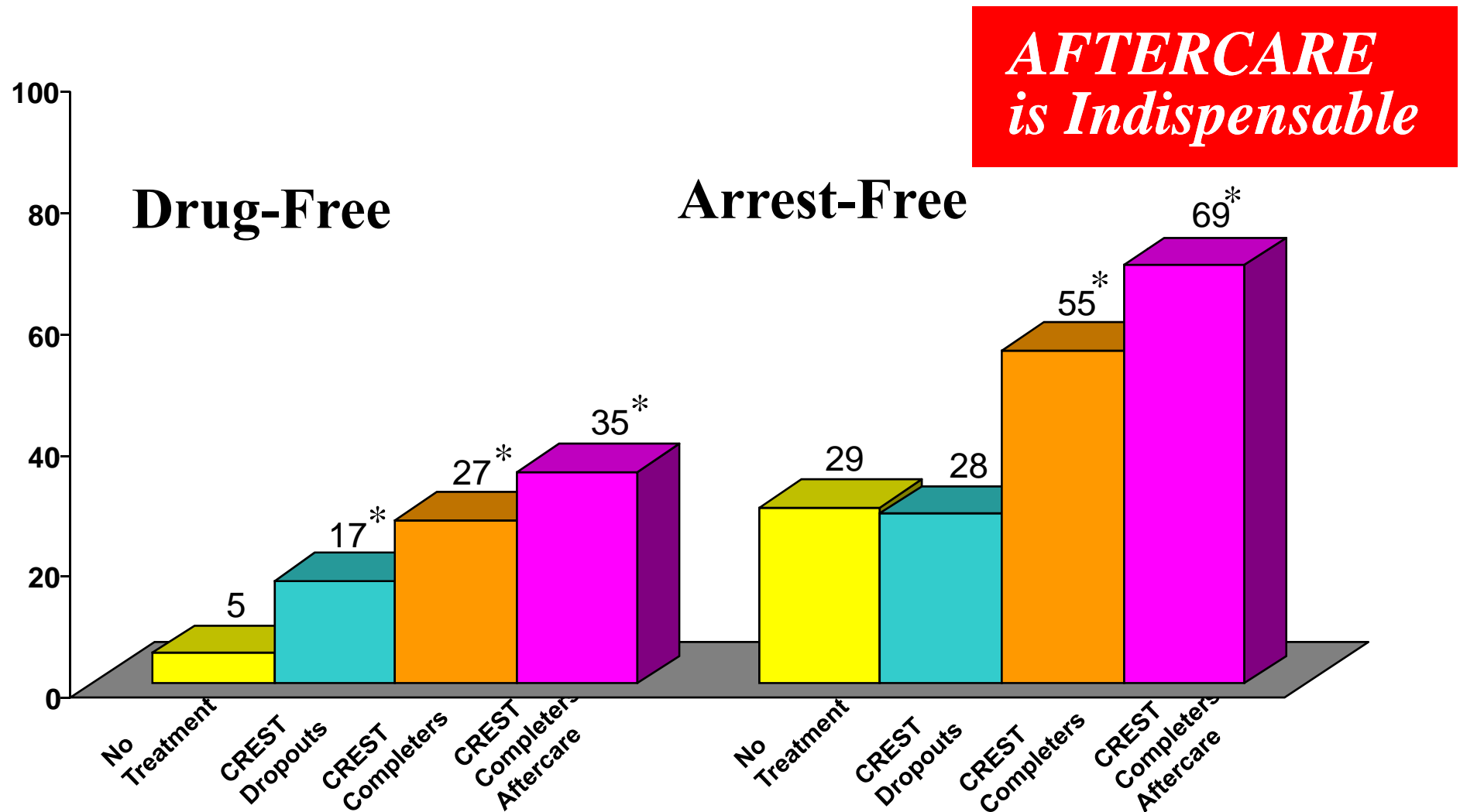
Percent of Participants Negative for Cocaine and Opiates
At 6 Month Follow-Up



Bernstein et al., J Addict Dis., 2005.

Delaware Work Release TC (Crest) + Aftercare

Drug-Free and Arrest-Free 3 Years After Release (N=448)



* p < .05 from Comparison

Martin, Butzin, Saum, & Inciardi (1999), *The Prison Journal*

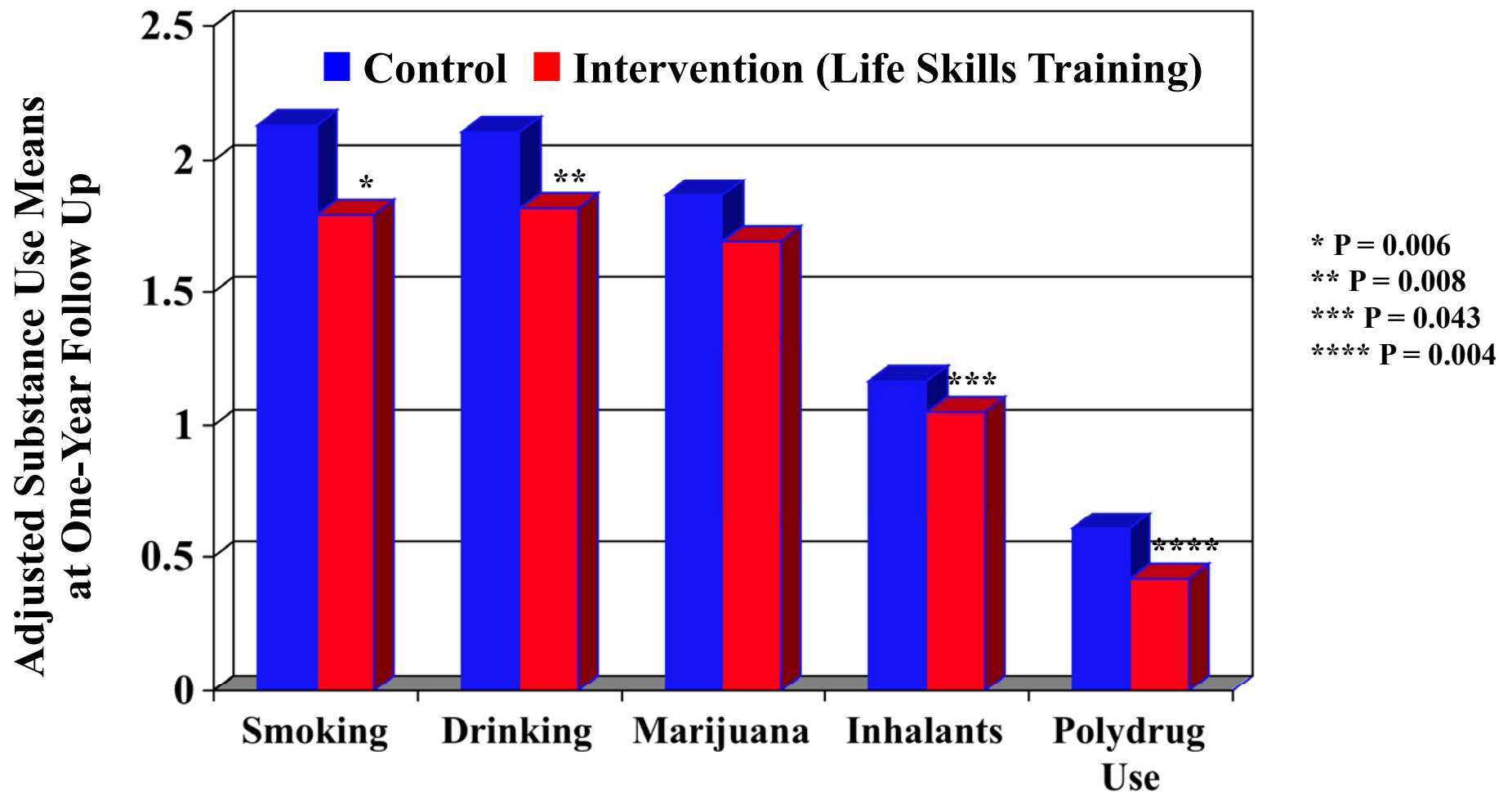
There Are Prevention Programs and Treatments for SUD But They Are Not Being Implemented Globally

- **Education System's for prevention**
- **Health Care System's for prevention and treatment**
- **Criminal Justice System's for treatment**



SUBSTANCE ABUSE IS *PREVENTABLE*

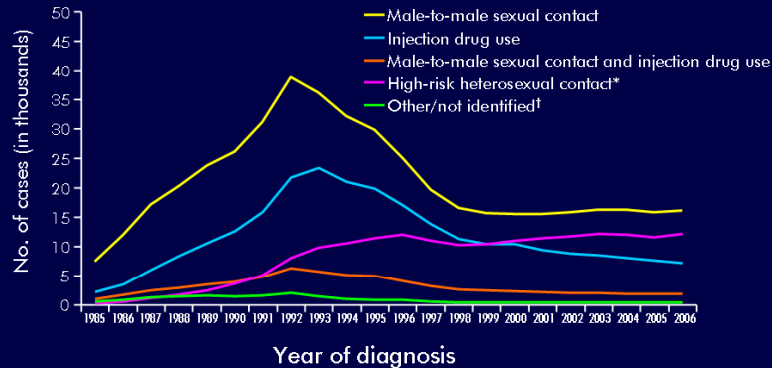
Effectiveness of a Universal Drug Abuse Prevention Approach For Youth at High Risk For Substance Abuse Initiation



Source: Griffin, KW et al., *Prevention Medicine* 36, 1-7, 2003.

Drug Use Has Played A Major Role in HIV Transmission

Estimated Number of AIDS Cases among Adults and Adolescents, by Transmission Category 1985–2006—United States and Dependent Areas

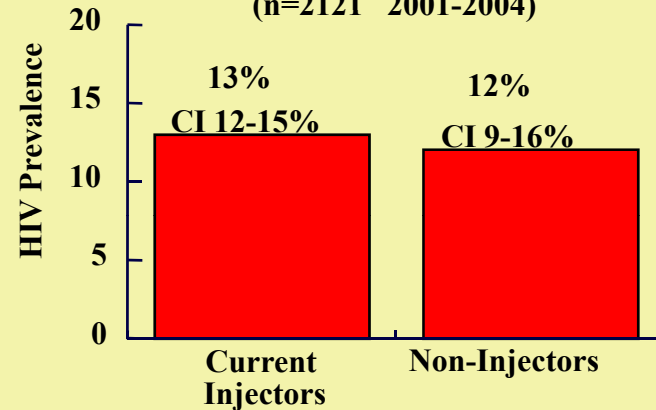


Note. Data have been adjusted for reporting delays, and cases without risk factor information have been proportionally redistributed.
 *Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
 †Includes hemophilia, blood transfusion, perinatal, and risk factor not reported or not identified.

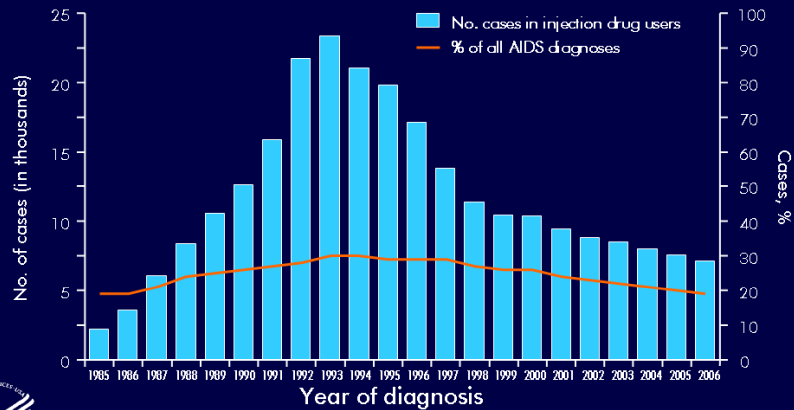


Convergence of HIV Seroprevalence Among Injecting and Non-injecting Drug Users

Drug Treatment Program (n=2121 2001-2004)



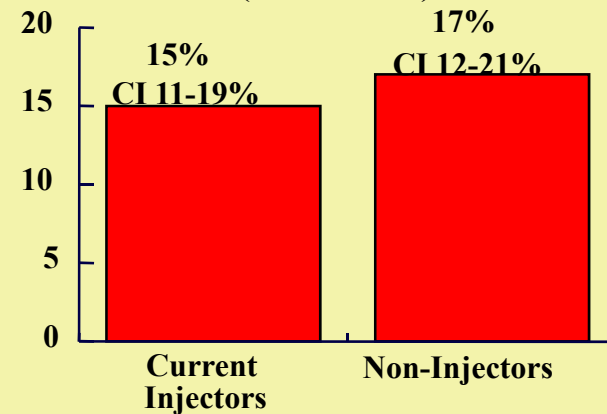
Estimated Number and Proportion of AIDS Cases among Adult and Adolescent Injection Drug Users 1985–2006—United States and Dependent Areas



Note. Data have been adjusted for reporting delays, and cases without risk factor information have been proportionally redistributed.

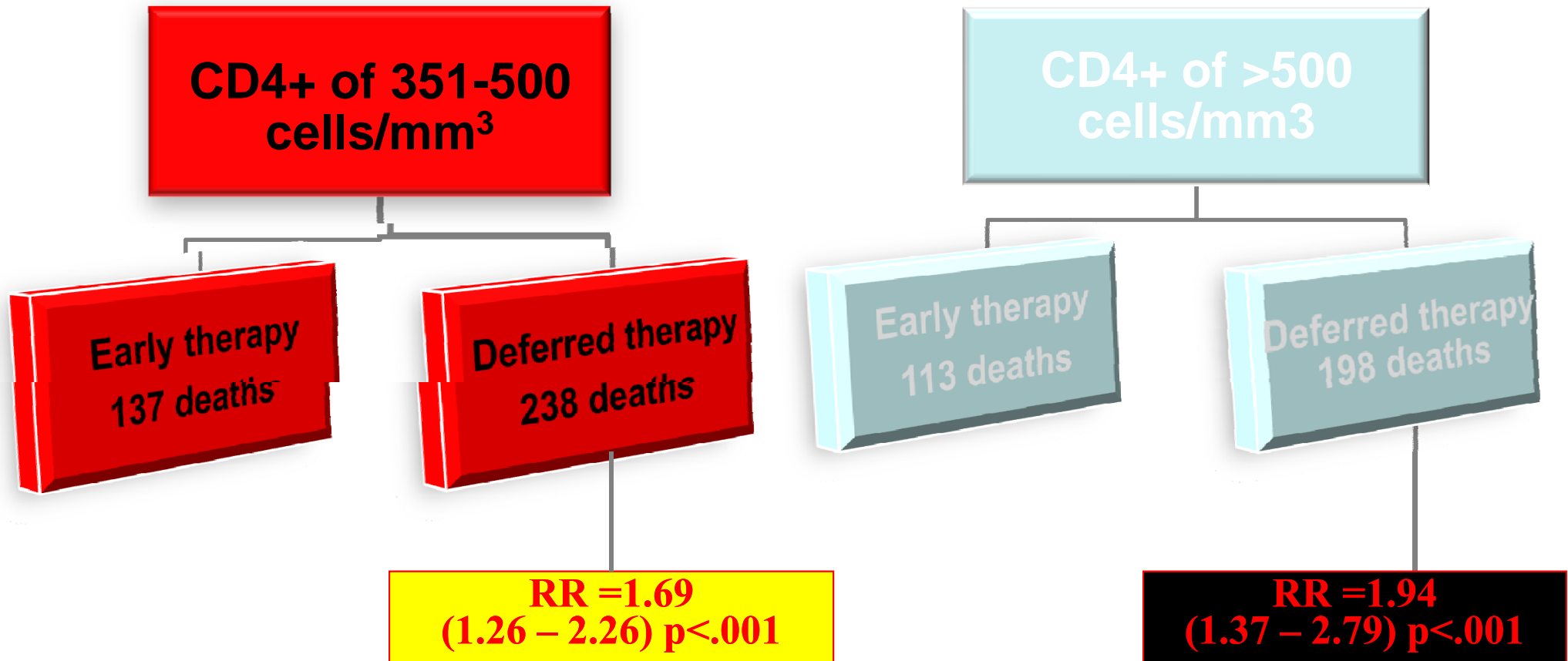


Respondent-Driven Sampling (n=448 2004)



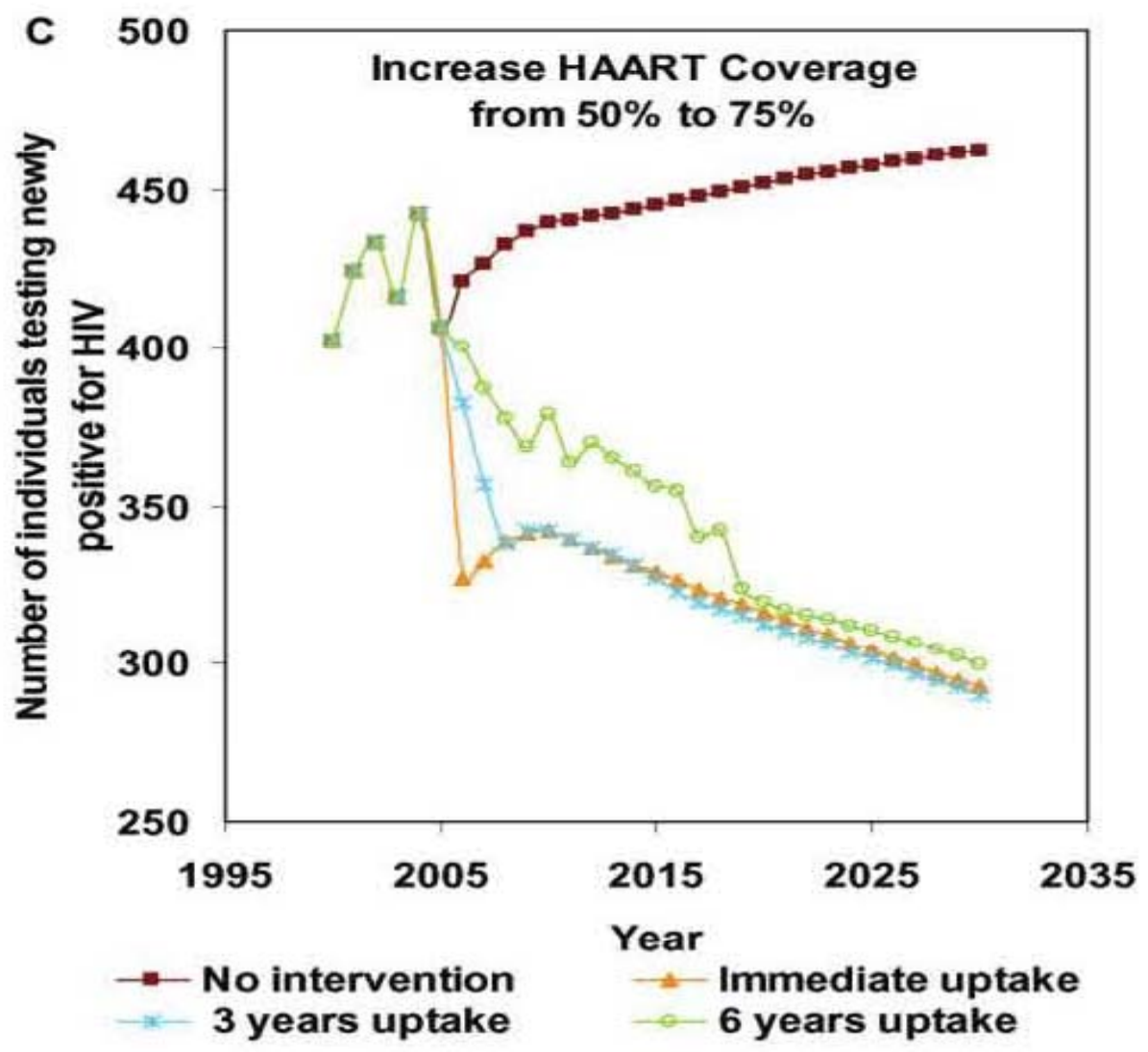
Source: Des Jarlais et al AIDS, 21: 231-235, 2007.

Increased Mortality from Deferred HAART Therapy for HIV



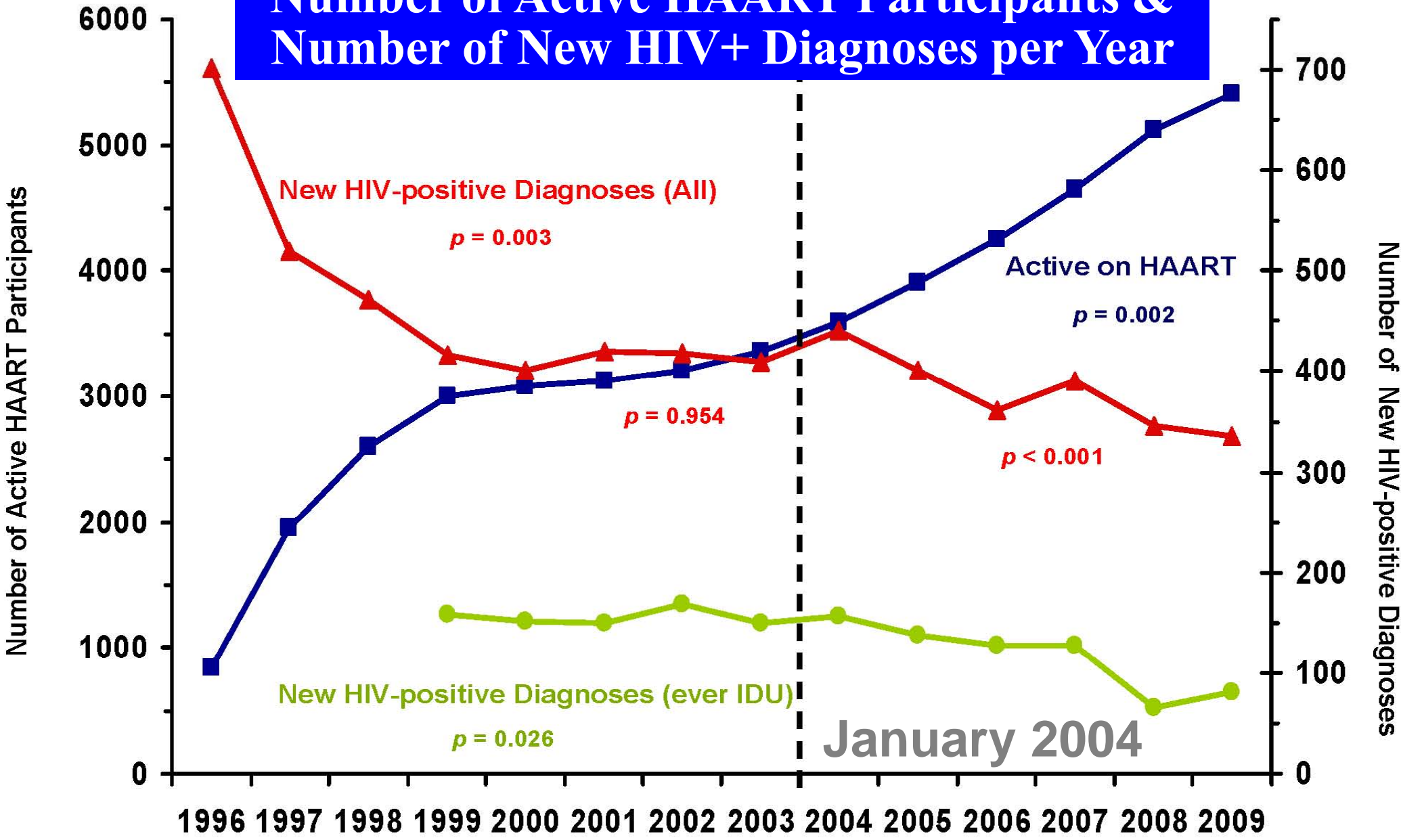
Kitahata et al., New England Journal of Medicine 2009;360:1815-26.

Expanded Access to HAART: A Potentially Powerful Strategy to Curb the Growth of the HIV Epidemic



Source: Lima VD et al., *HAART and HIV Prevention*. 2008; 198: 59-67.

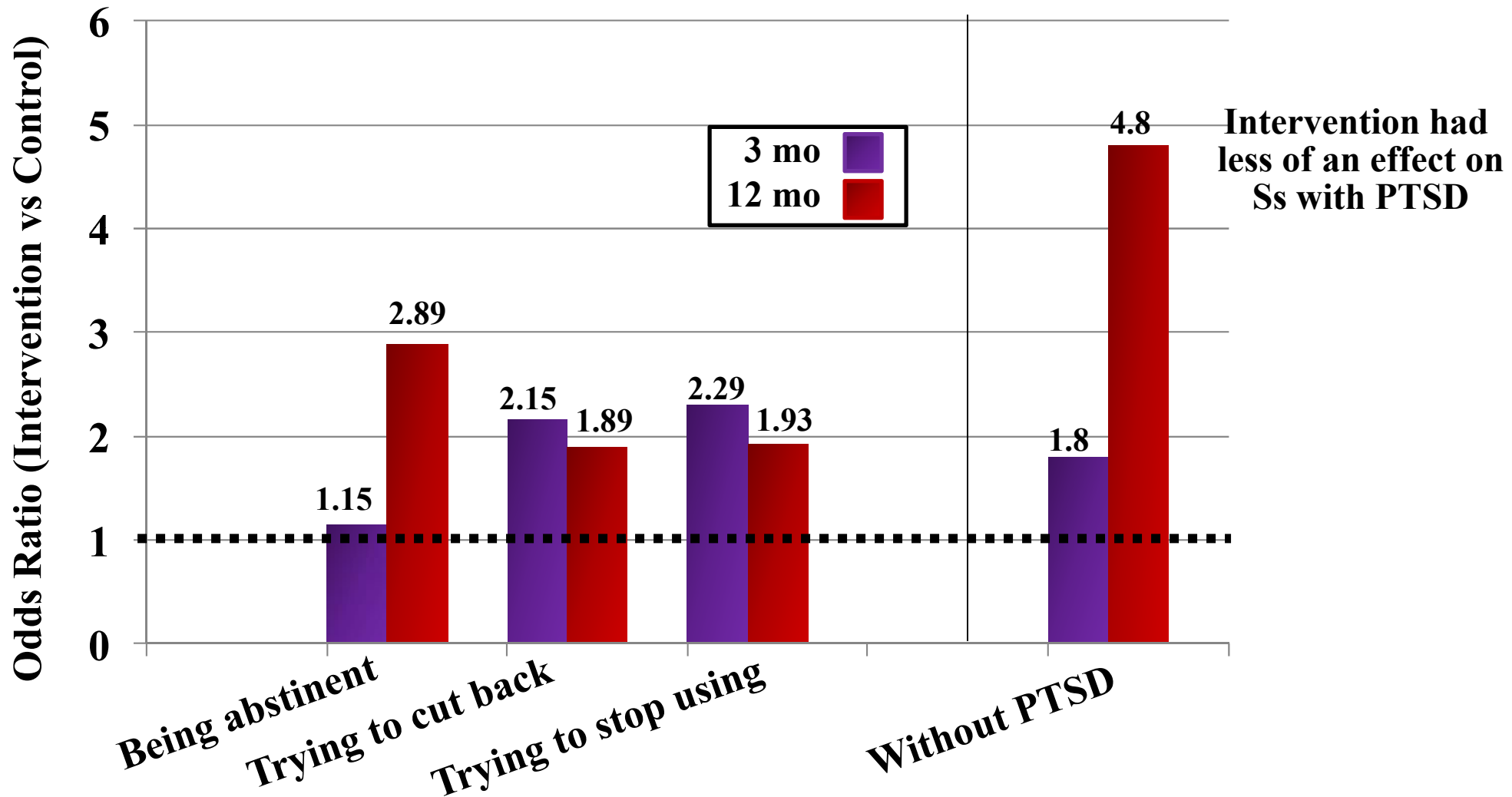
Number of Active HAART Participants & Number of New HIV+ Diagnoses per Year



Year

Montaner et al, CROI 2010

Screening & Brief Intervention Promoted Marijuana Abstinence & Reduced Consumption among Pediatric Emergency Department Patients



Source: Bernstein E et al., *Academic Emergency Medicine* 2009; 16(11): 1174-1185.

**We Need to Better Integrate Drug Abuse
Screening, Prevention & Treatment into the**

Healthcare System

