NIDA AIDS Research Program

HIV/AIDS Research at the National Institute on Drug Abuse: Priorities and Opportunities



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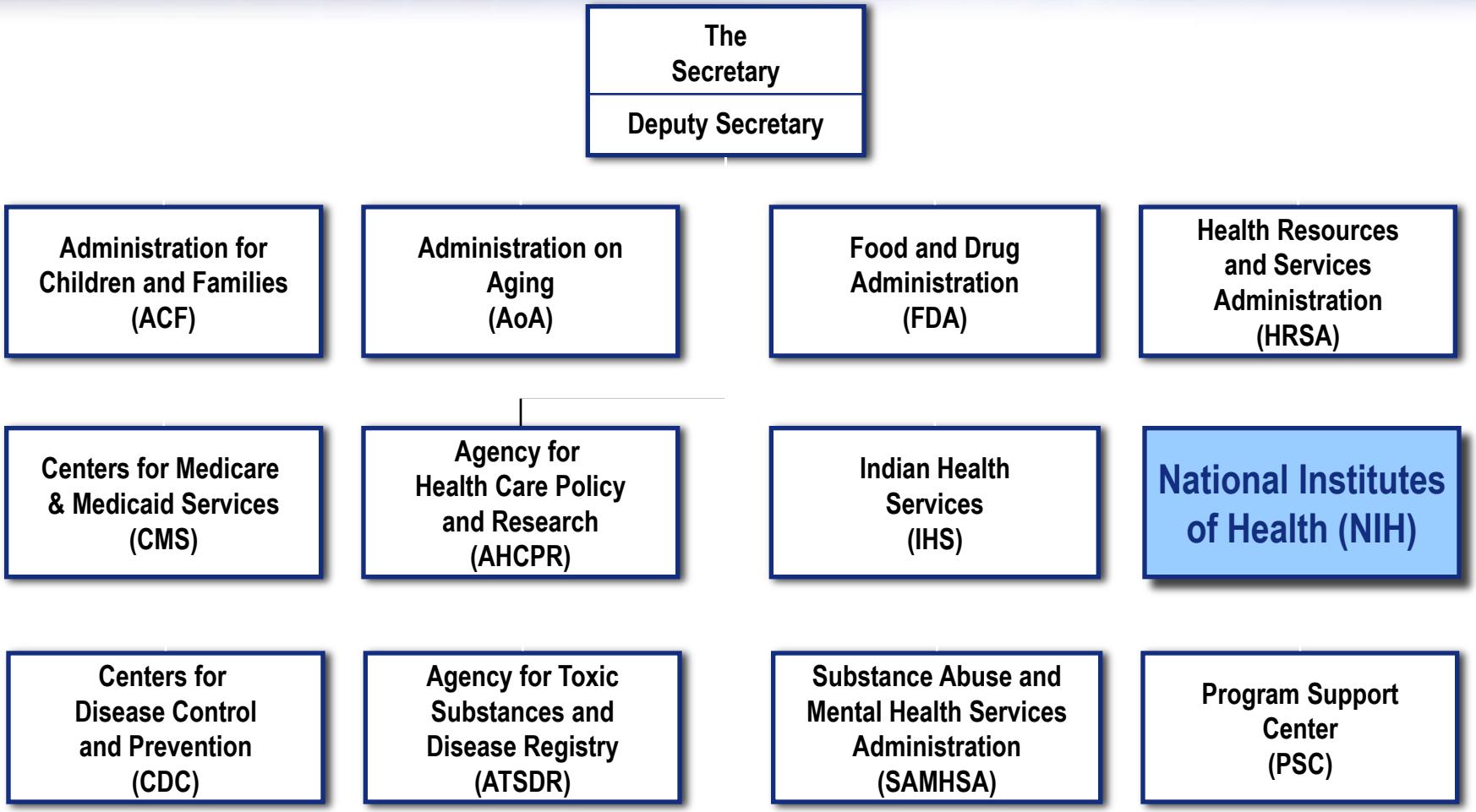
Verona, Italy
April 3, 2014

U.S. Department of Health and Human Services
National Institutes of Health
NIH National Institute on Drug Abuse

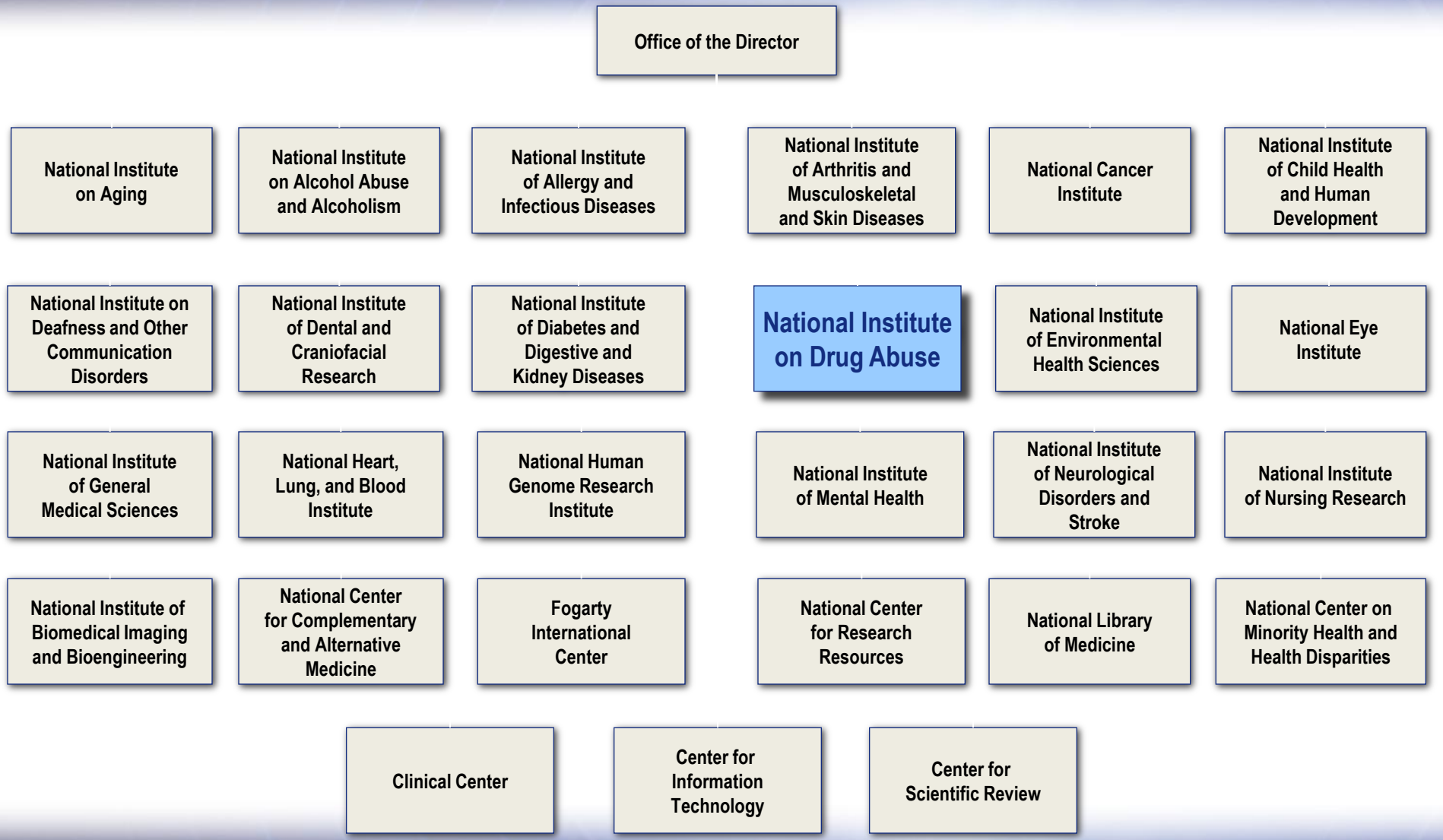
Objectives

- Introduction to NIDA AIDS Program: Structure & Resources
- Epidemiological Picture: Characterize Target Populations
- HIV Prevention: What Works and Barriers
- What Is Next:
  - NIDA's HIV/AIDS Research Priorities
  - NIDA's New HIV/AIDS Initiatives

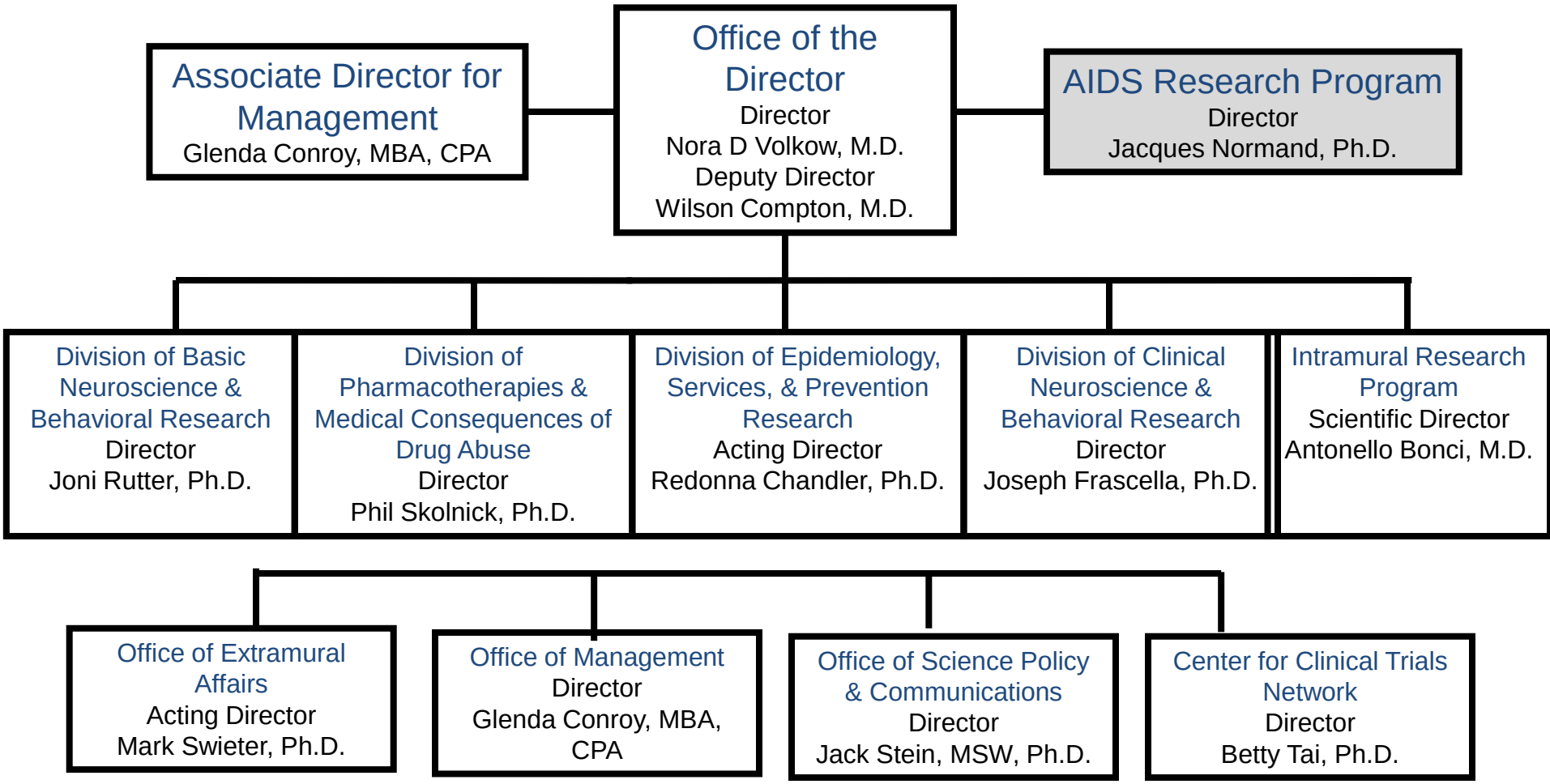
U.S. Department of Health and Human Services



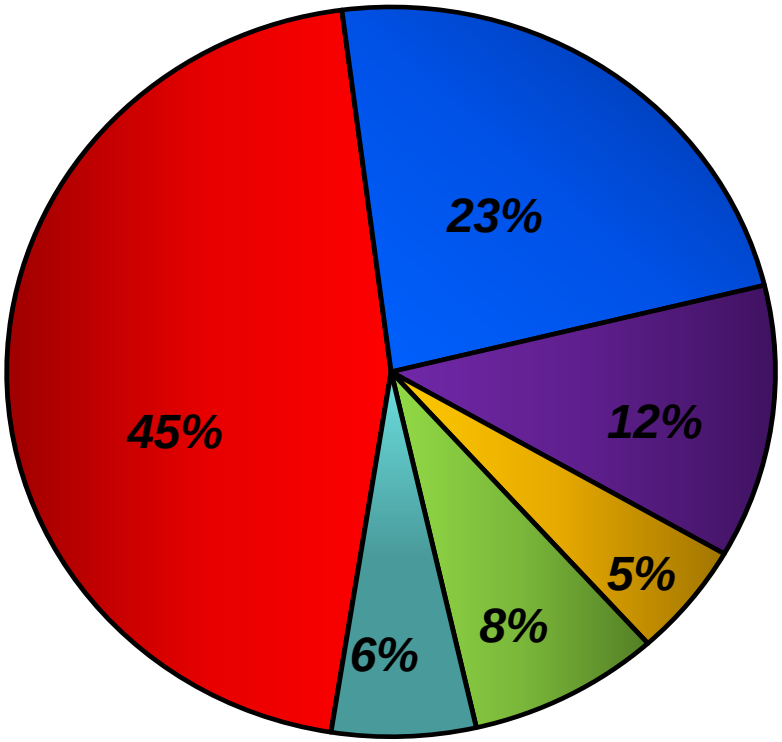
National Institutes of Health



National Institute on Drug Abuse

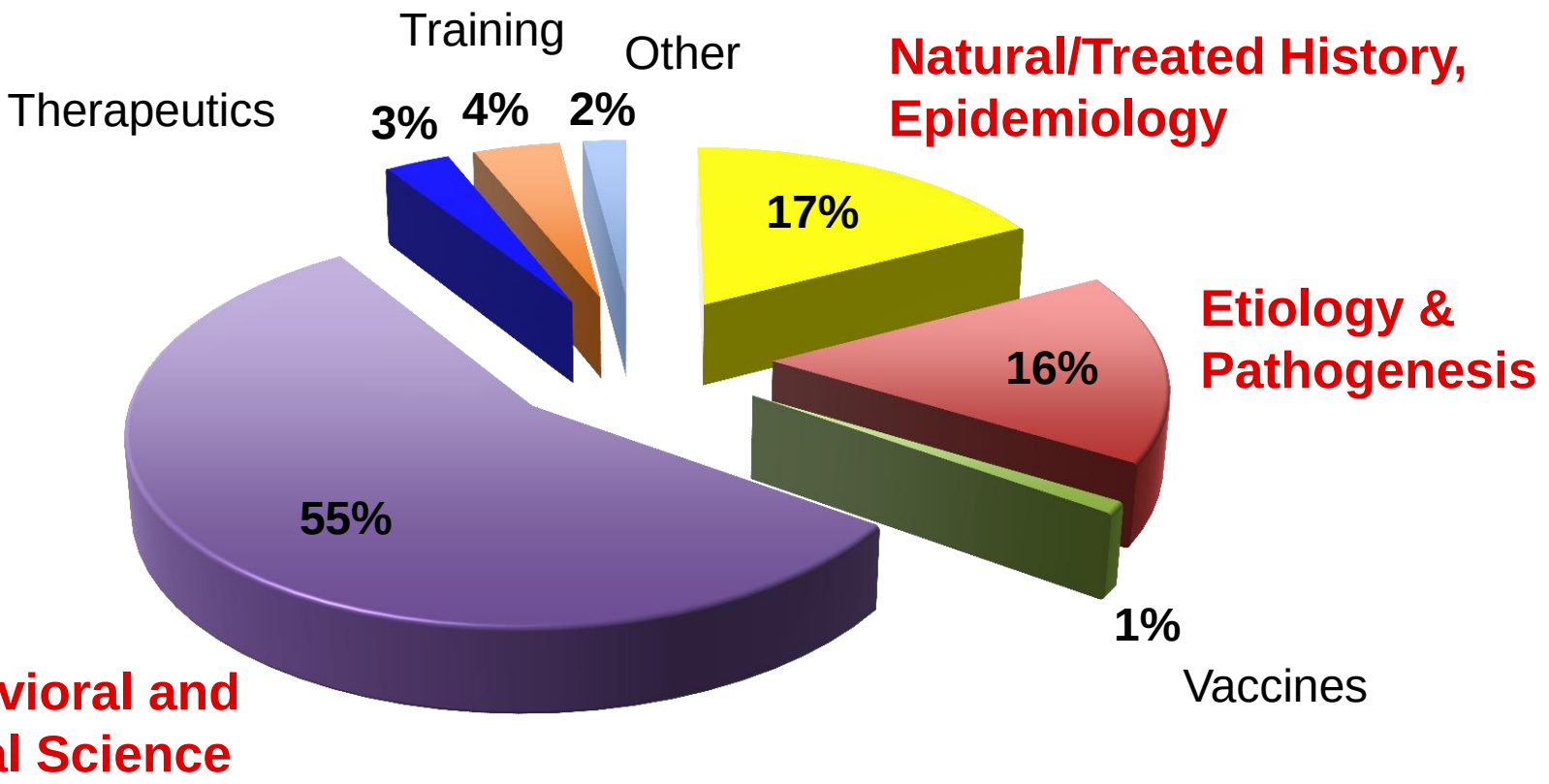


Budget - National Institute on Drug Abuse



- *Basic & Clinical Neuroscience & Behavioral Research -- 45%*
- *Epidemiology, Services & Prevention Research -- 23%*
- *Pharmacotherapies & Medical Consequences -- 12%*
- *Clinical Trials Network -- 5%*
- *Intramural Research -- 8%*
- *RM&S -- 6%*

NIDA HIV/AIDS FY12 Program Profile



NIDA HIV/AIDS Budget by Research Area

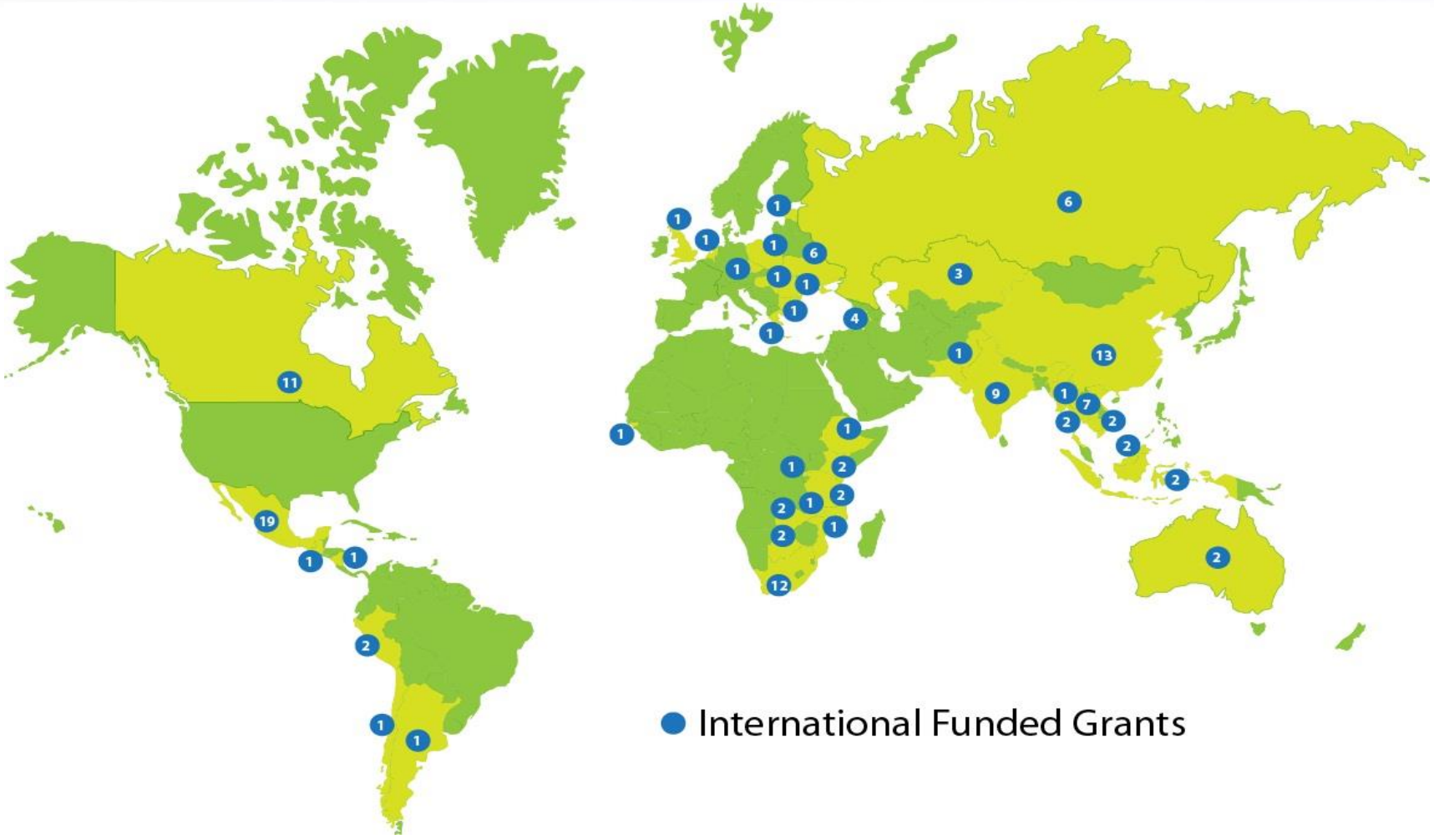
Natural History and Epidemiology---------- **$44M**
Etiology and Pathogenesis---------- **$41M**
Microbicides---------- **$0**
Vaccines---------- **$4M**
Behavioral and Social Science---------- **$188M**
Therapeutics---------- **$8M**
Training, Infrastructure, and
Capacity Building---------- **$13M**
Information Dissemination---------- **$2M**

AIDS Funding by NIDA Divisions

DPMC	**$17M**
DESPR	**$133M**
DCNBR	**$55M**
DBNBR	**$36M**
CCTN	**$20M**
IRP	**$12M**
OD	**$11M**

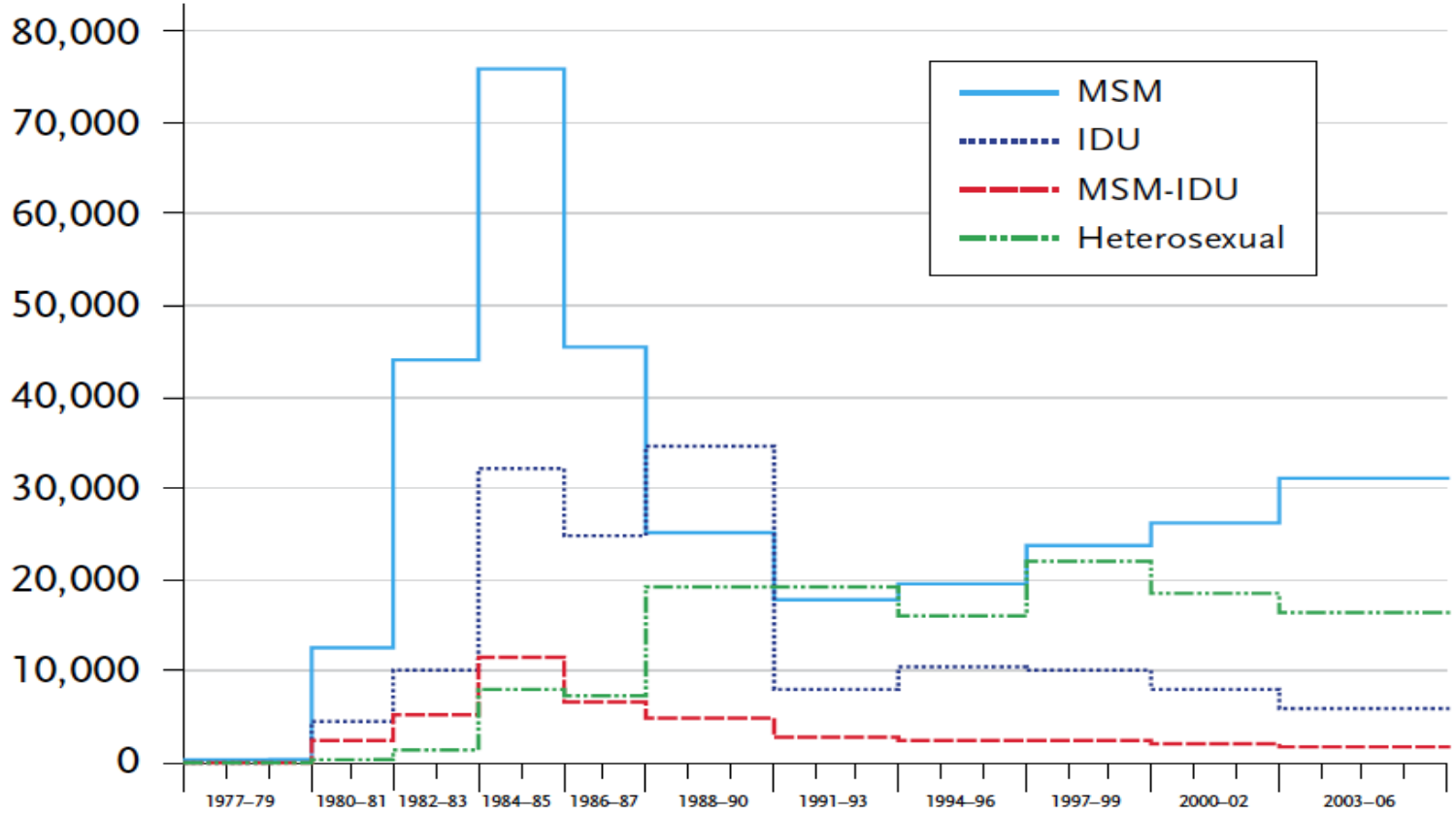
Recent International Awards

NIDA Funded Grants



Epidemiological Picture

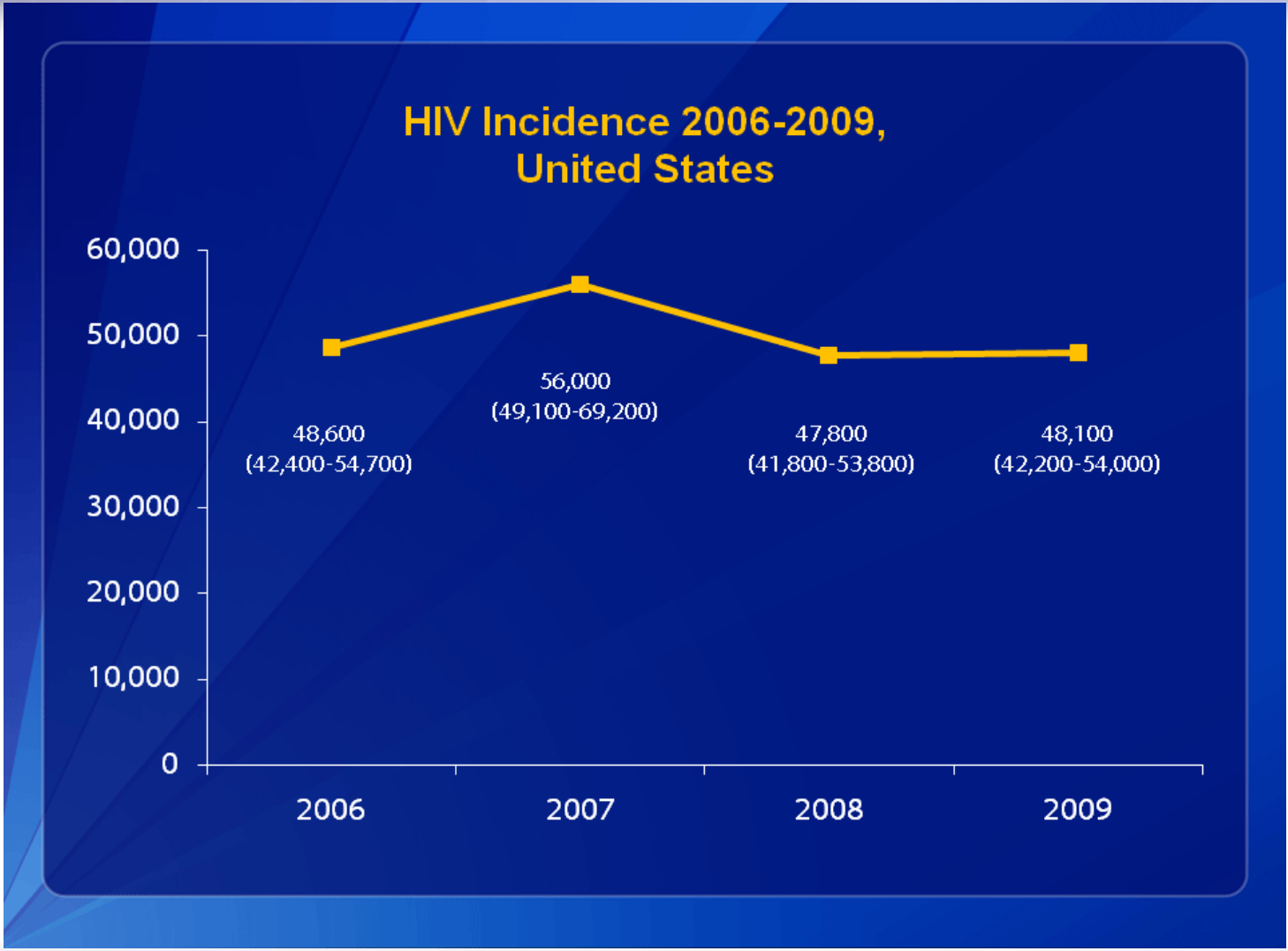
Estimated # of new infections in US by Transmission Category



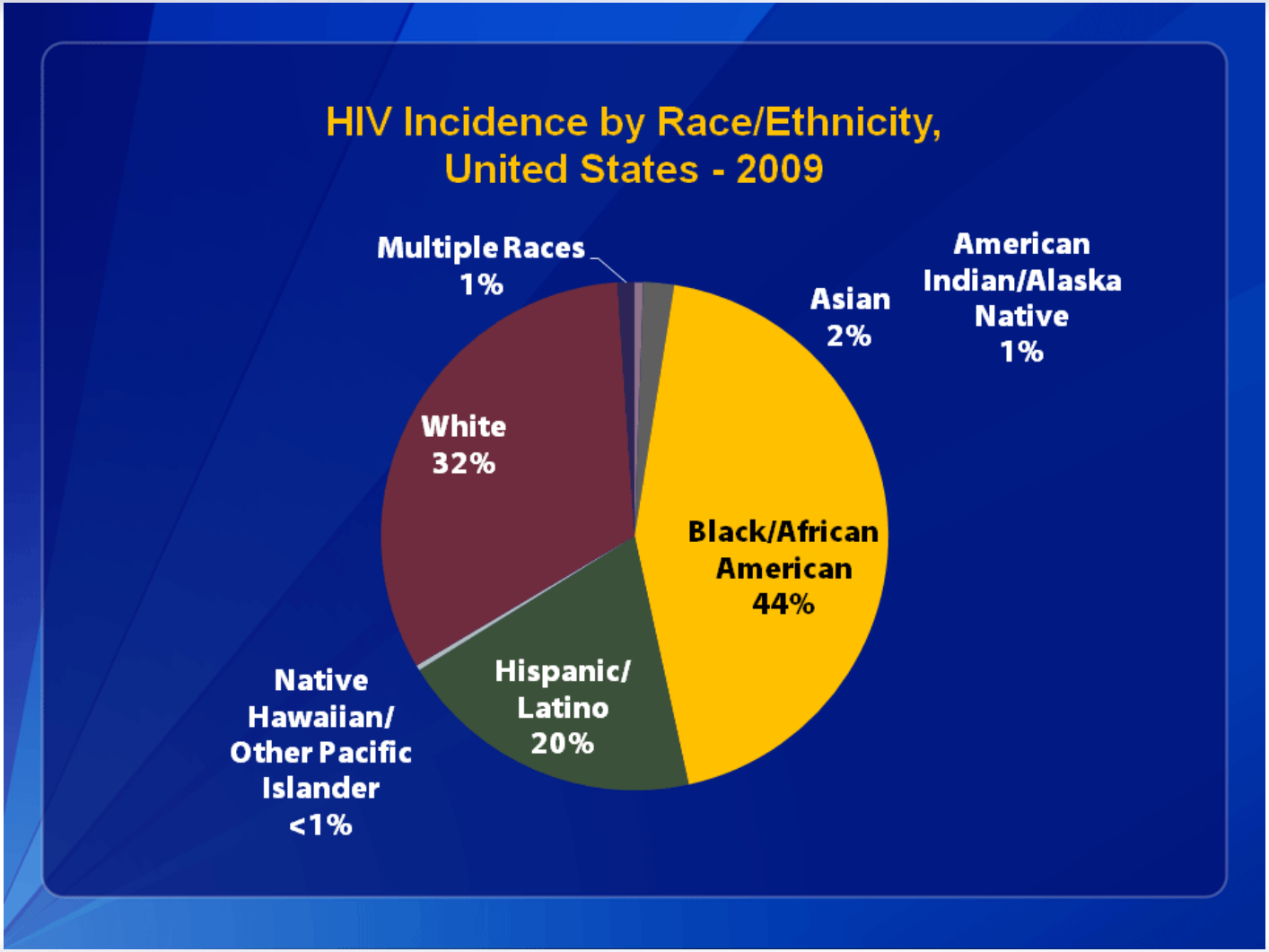
Note: Estimates are for 2-year intervals during 1980–1987, 3-year intervals during 1977–1979 and 1988–2002, and a 4-year interval for 2003–2006.

Source: Hall, H.I., et al. JAMA, August 6, 2008—Vol 300, No. 5, 520-529

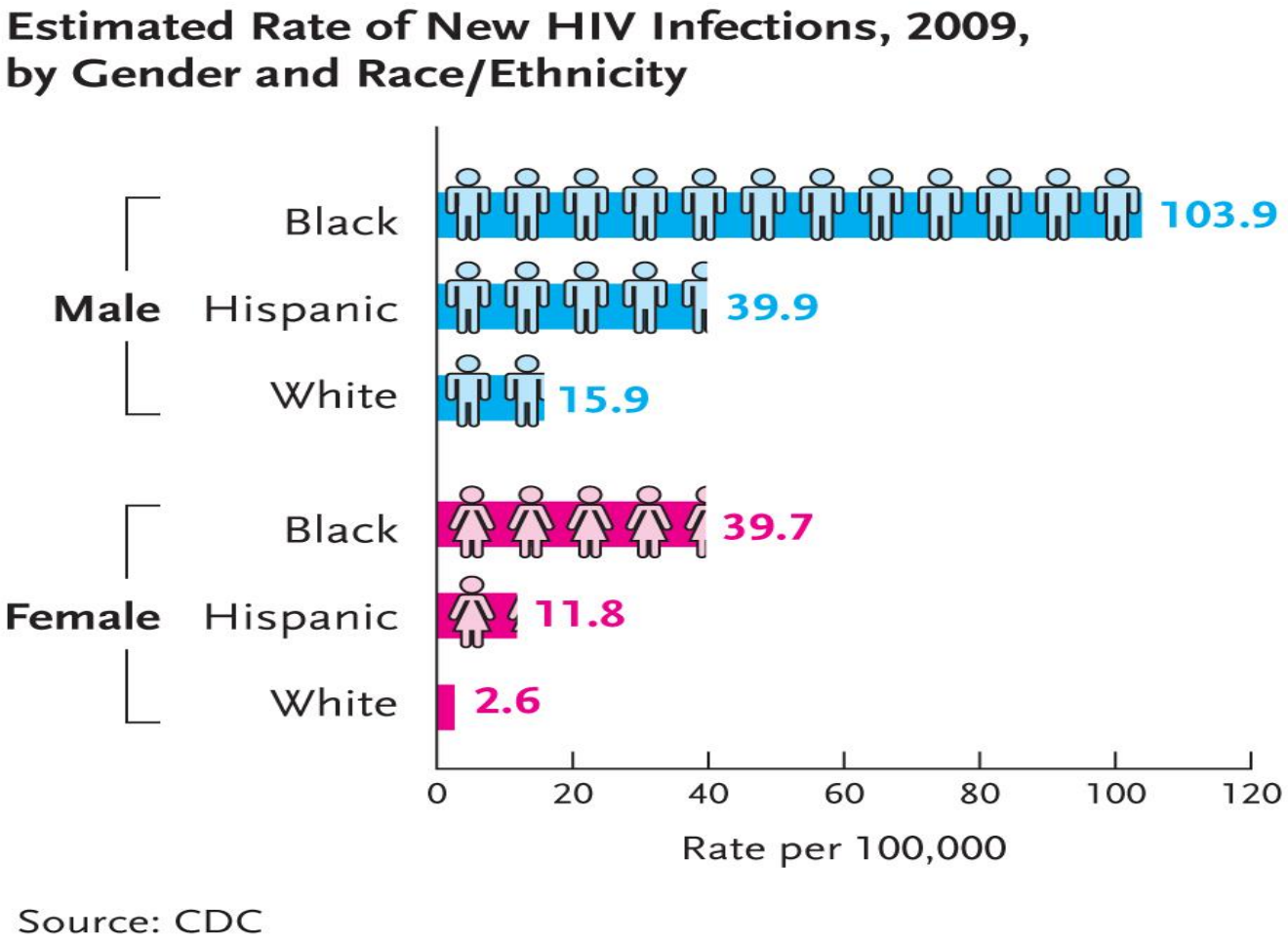
Domestic Epidemiology



Domestic Epidemiology

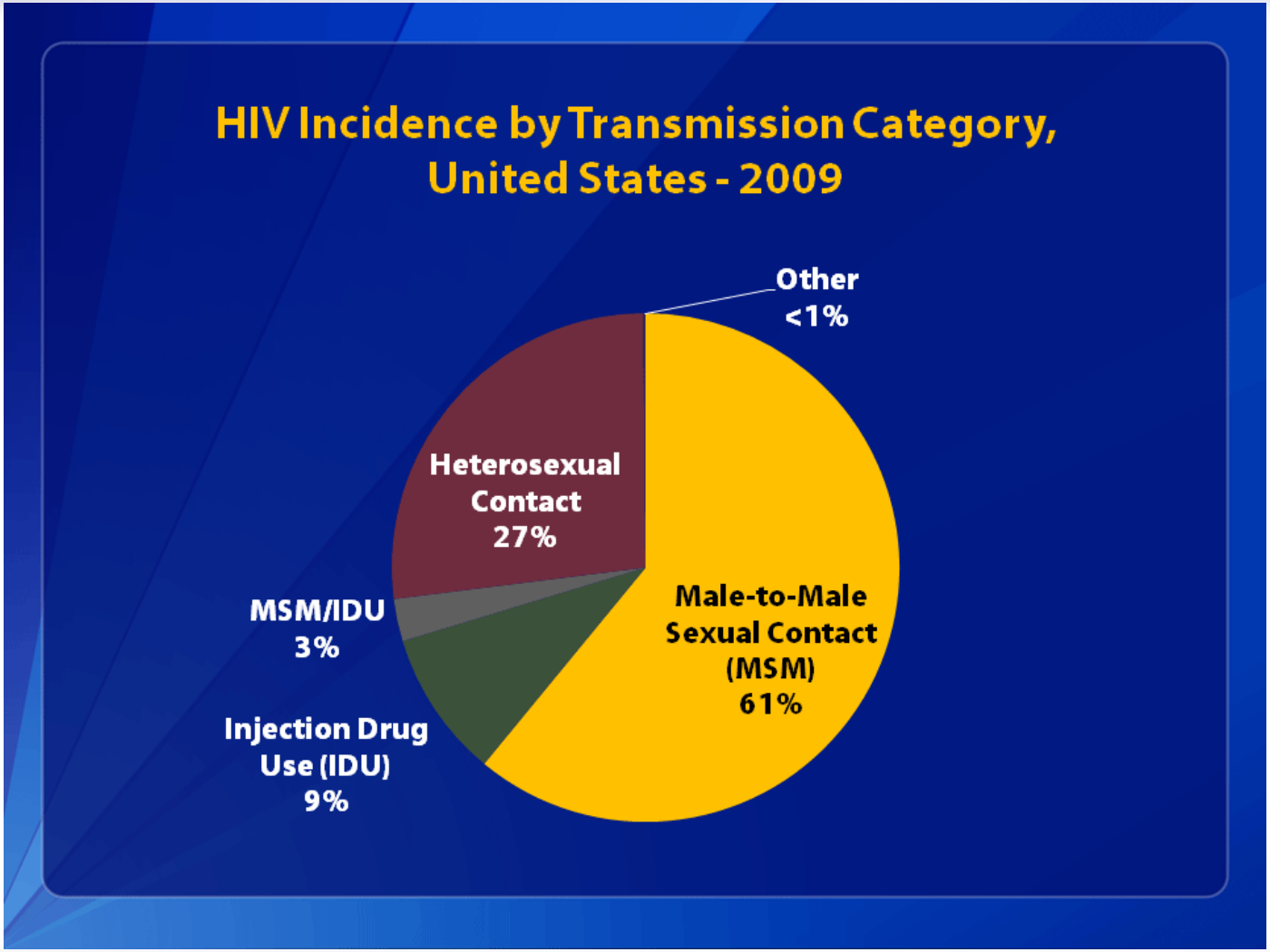


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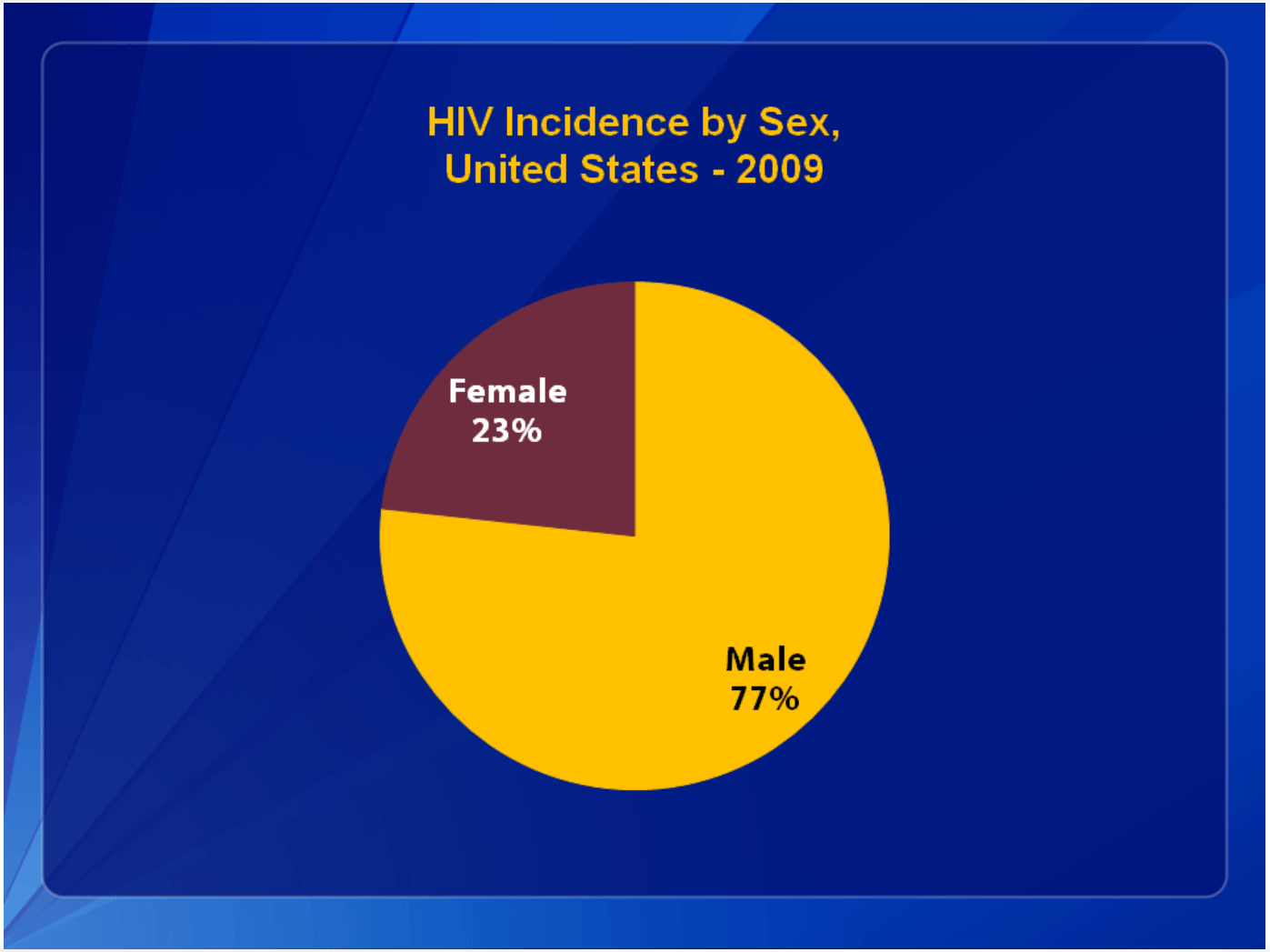


Source: CDC

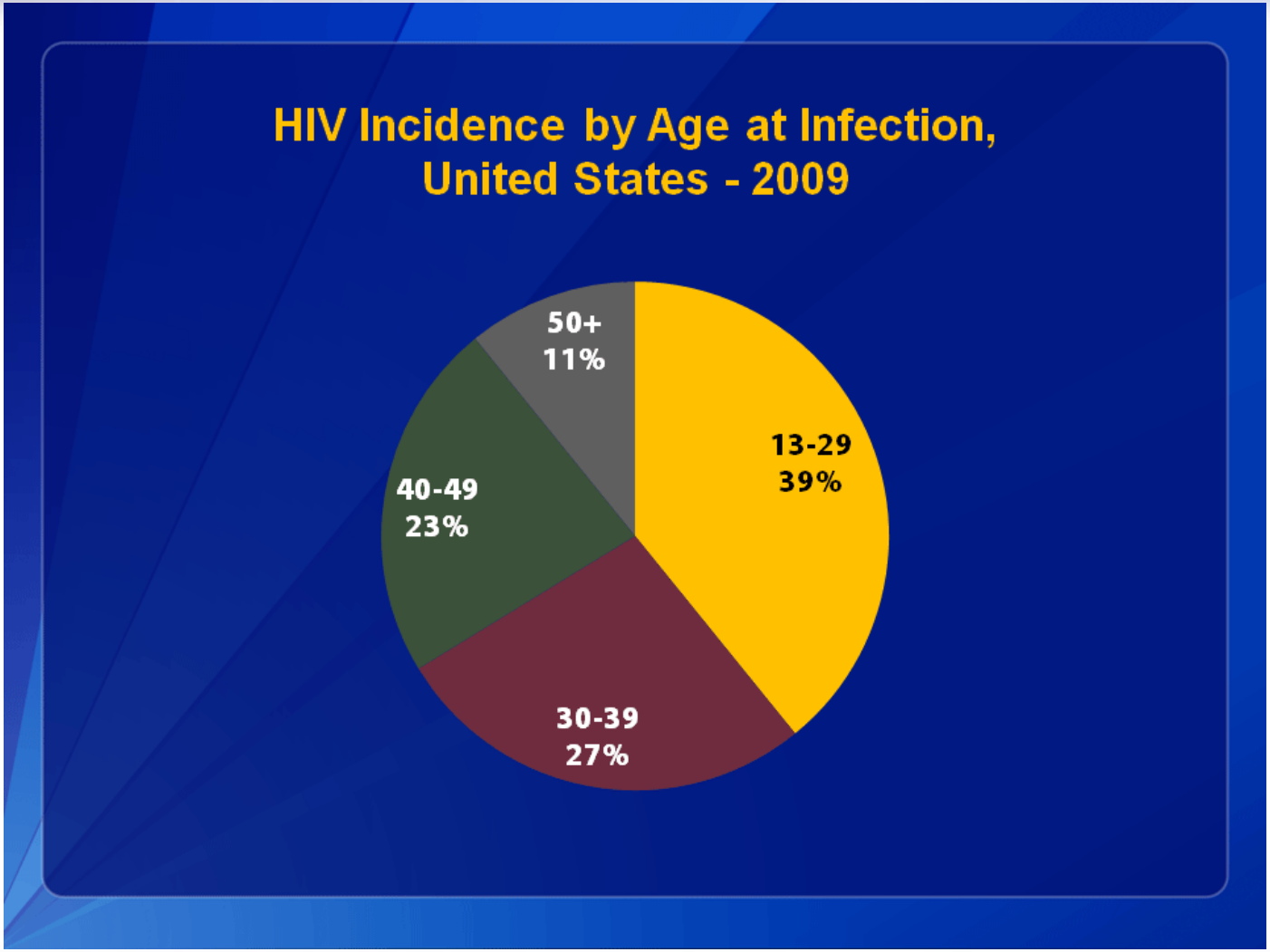
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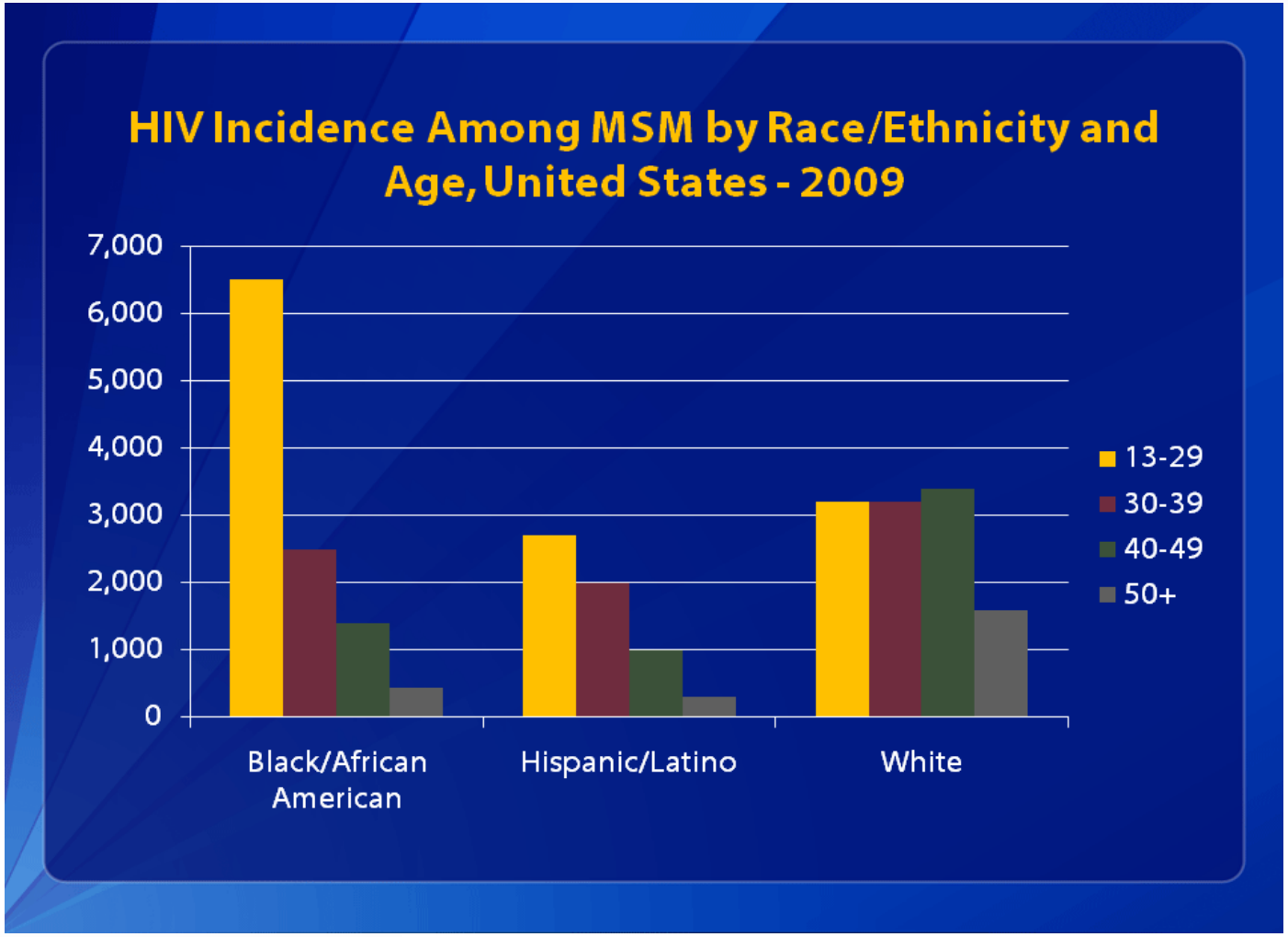
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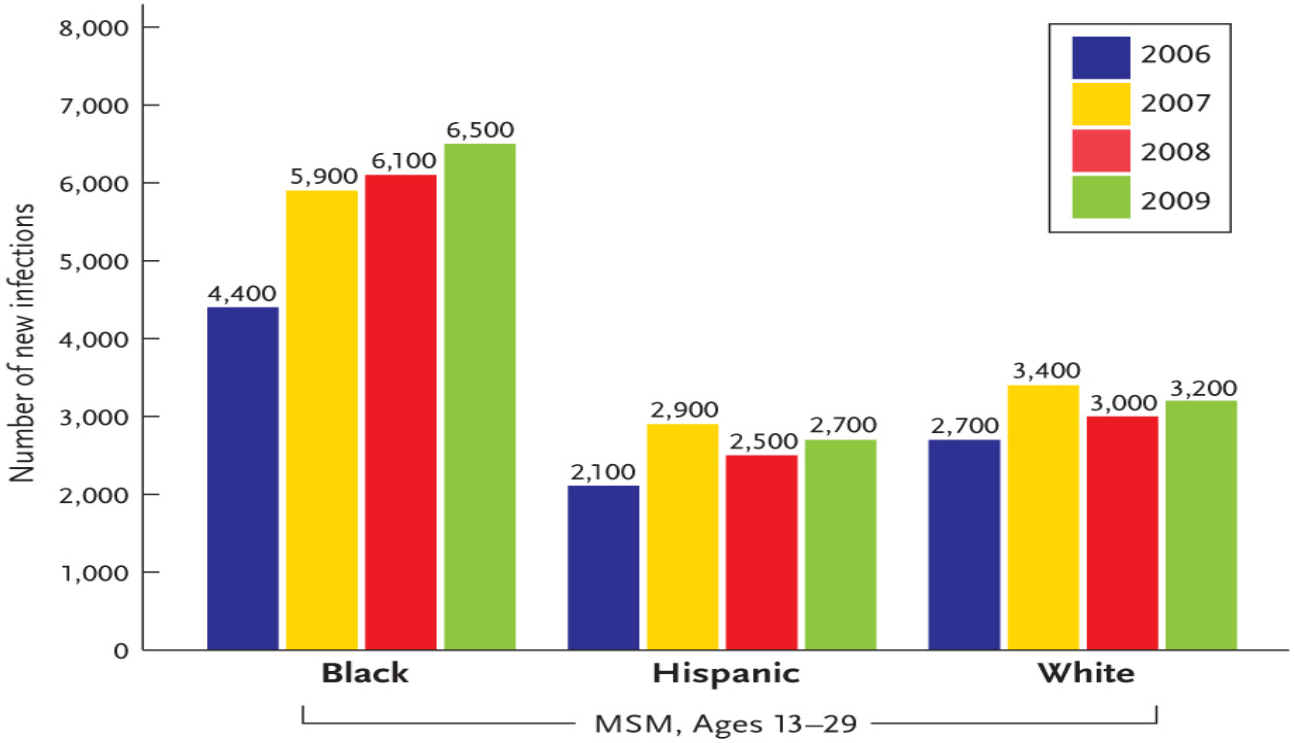


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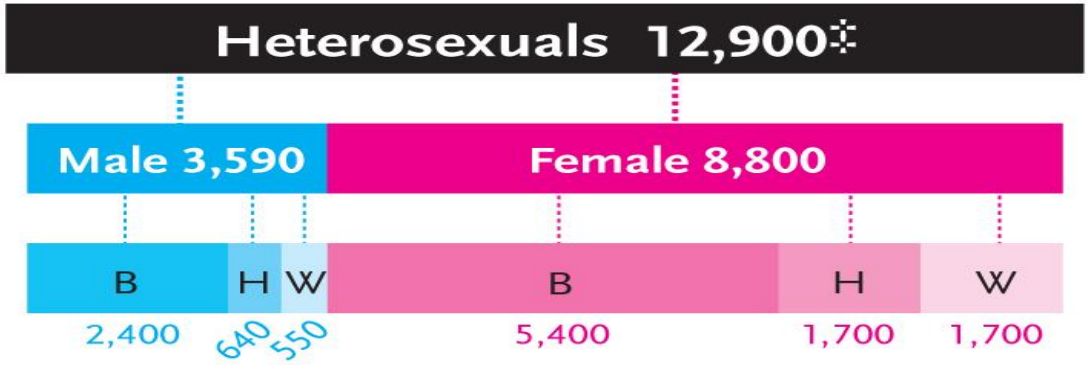
Estimated Number of New HIV Infections among Men Who Have Sex with Men (MSM), Ages 13–29, 2006–2009, by Race/Ethnicity



Source: CDC

Domestic Epidemiology

Estimated New HIV Infections among Heterosexuals, 2009, by Gender and Race/Ethnicity

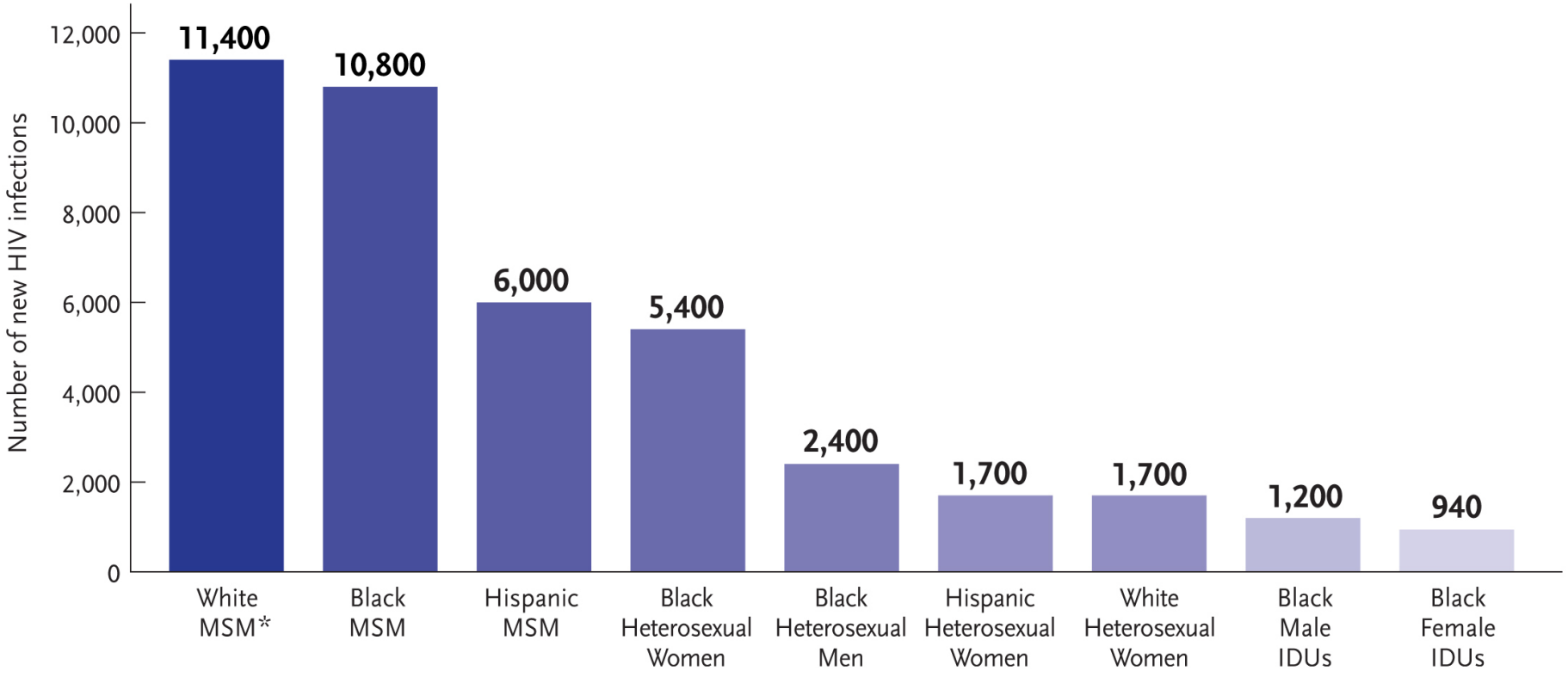


B = Black H = Hispanic W = White

‡ This chart includes estimates, by gender, for blacks, Hispanics, and whites only. Note that the total estimated number of HIV infections among heterosexuals includes an additional 510 infections. These represent cases among American Indians/ Alaska Natives, Asians, Native Hawaiians/Other Pacific Islanders, and individuals of multiple races. Specific estimates of HIV incidence in each of these populations could not be reliably estimated due to the relatively small number of HIV infections.

Source: CDC

New HIV Infections by Subpopulations



*The term men who have sex with men is used in CDC surveillance systems because it indicates the behaviors that transmit HIV infection, rather than how individuals self-identify in terms of their sexuality.

Source: CDC

What Works:
Proven HIV Prevention Strategies

Components of a Comprehensive HIV Prevention Strategy

- Drug treatment as HIV prevention
- ART as HIV prevention (TasP/STTR, MCT)
- Testing ~~and counseling~~
- Community-based outreach
- Syringe Access: NEPs and pharmacy access
- Supervised Injection Rooms
- Sexual Risk Reduction (Condom Use)
- PrEP/Microbicides and PEP
- Male Circumcision
- Prevention and Treatment of STI

Project Aware

Effect of Risk-Reduction Counseling With Rapid HIV Testing on Risk of Acquiring Sexually Transmitted Infections
The AWARE Randomized Clinical Trial

Objective To assess the effect of brief patient-centered risk-reduction counseling at the time of a rapid HIV test on the subsequent acquisition of sexually transmitted infections (STIs).

Design, Setting, and Participants From April to December 2010, Project AWARE randomized 5012 patients from 9 sexually transmitted disease (STD) clinics in the United States to receive either brief patient-centered HIV risk-reduction counseling with a rapid HIV test or the rapid HIV test with information only. Participants were assessed for multiple STIs at both baseline and 6-month follow-up.

Interventions Participants randomized to counseling received individual patient-centered risk-reduction counseling based on an evidence-based model. The core elements included a focus on the patient's specific HIV/STI risk behavior and negotiation of realistic and achievable risk-reduction steps. All participants received a rapid HIV test.

Main Outcomes and Measures The prespecified outcome was a composite end point of cumulative incidence of any of the measured STIs over 6 months. All participants were tested for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Treponema pallidum* (syphilis), herpes simplex virus 2, and HIV. Women were also tested for *Trichomonas vaginalis*.

Results There was no significant difference in 6-month composite STI incidence by study group (adjusted risk ratio, 1.12; 95% CI, 0.94-1.33). There were 250 of 2039 incident cases (12.3%) in the counseling group and 226 of 2032 (11.1%) in the information-only group.

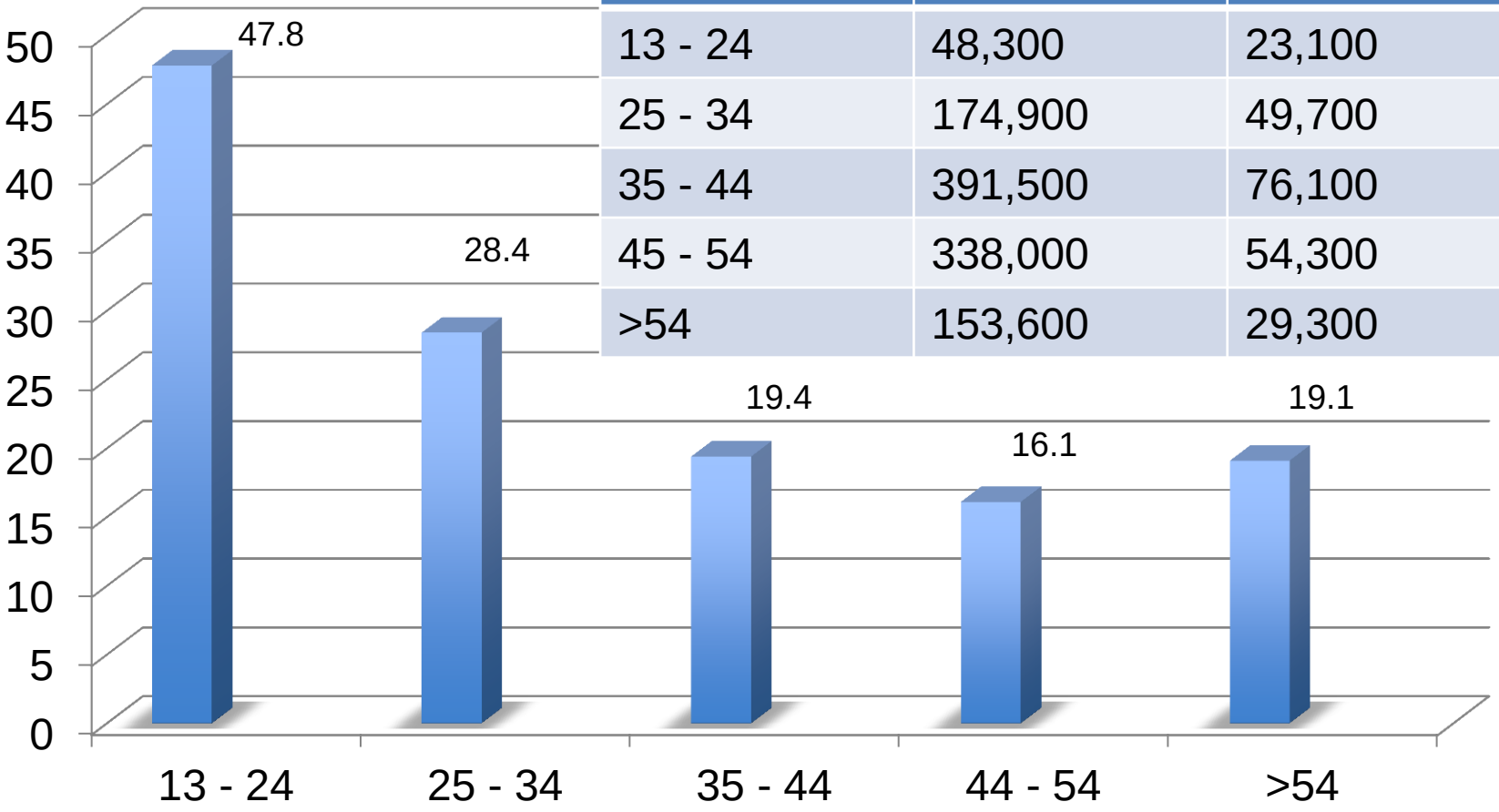
Conclusion and Relevance Risk-reduction counseling in conjunction with a rapid HIV test did not significantly affect STI acquisition among STD clinic patients, suggesting no added benefit from brief patient-centered risk-reduction counseling.

Metsch, L., et al. JAMA. 2013;310(16):1701-1710.

Barriers to Implementing Efficacious HIV Prevention Strategies

% Undiagnosed HIV Cases by Age

Age	HIV +	Undiagnosed
13 - 24	48,300	23,100
25 - 34	174,900	49,700
35 - 44	391,500	76,100
45 - 54	338,000	54,300
>54	153,600	29,300



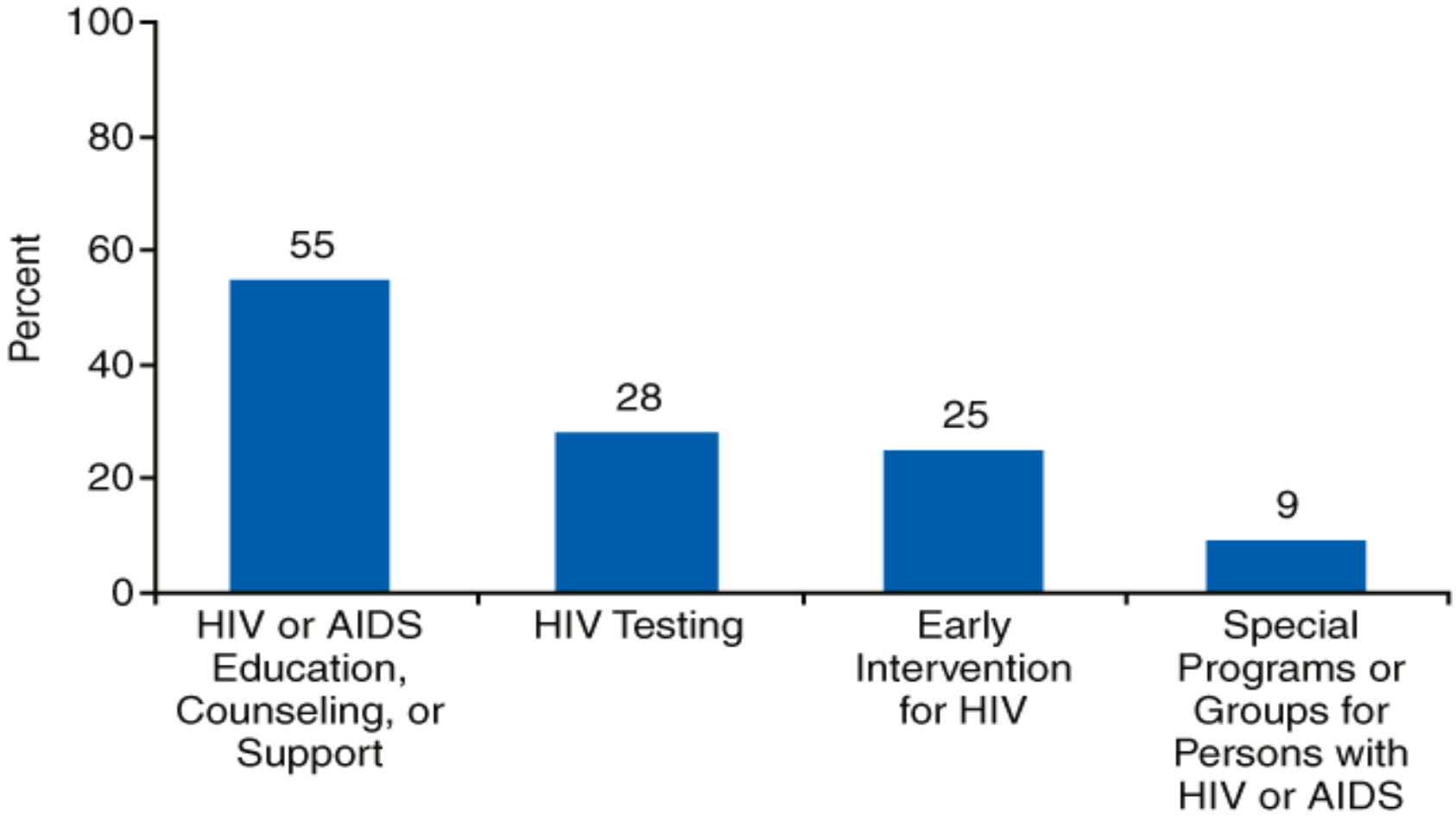
Campsmith, M.L. Rhodes, P.H., Hall, H.I., & Green, Timothy, T.A. (2010). Undiagnosed HIV Prevalence Among Adults and Adolescents in the US at the End of 2006, JAIDS, Vol 53, 619-624.

Recent MMWR

- 60% of HIV+ youth (i.e., 13-24 yrs) don't know their serostatus
- Youth testing:
  - 13% of High School students (22% of those who have ever had sexual intercourse)
  - 35% among 18-24 yrs
- Youth represent 26% of new infections in 2010
- Among HIV + youth, 72 % are MSM; 20% heterosexual; 4% IDUs; and 4% MSM and IDUs

MMWR, November 30, 2012; 61(47); 971-976

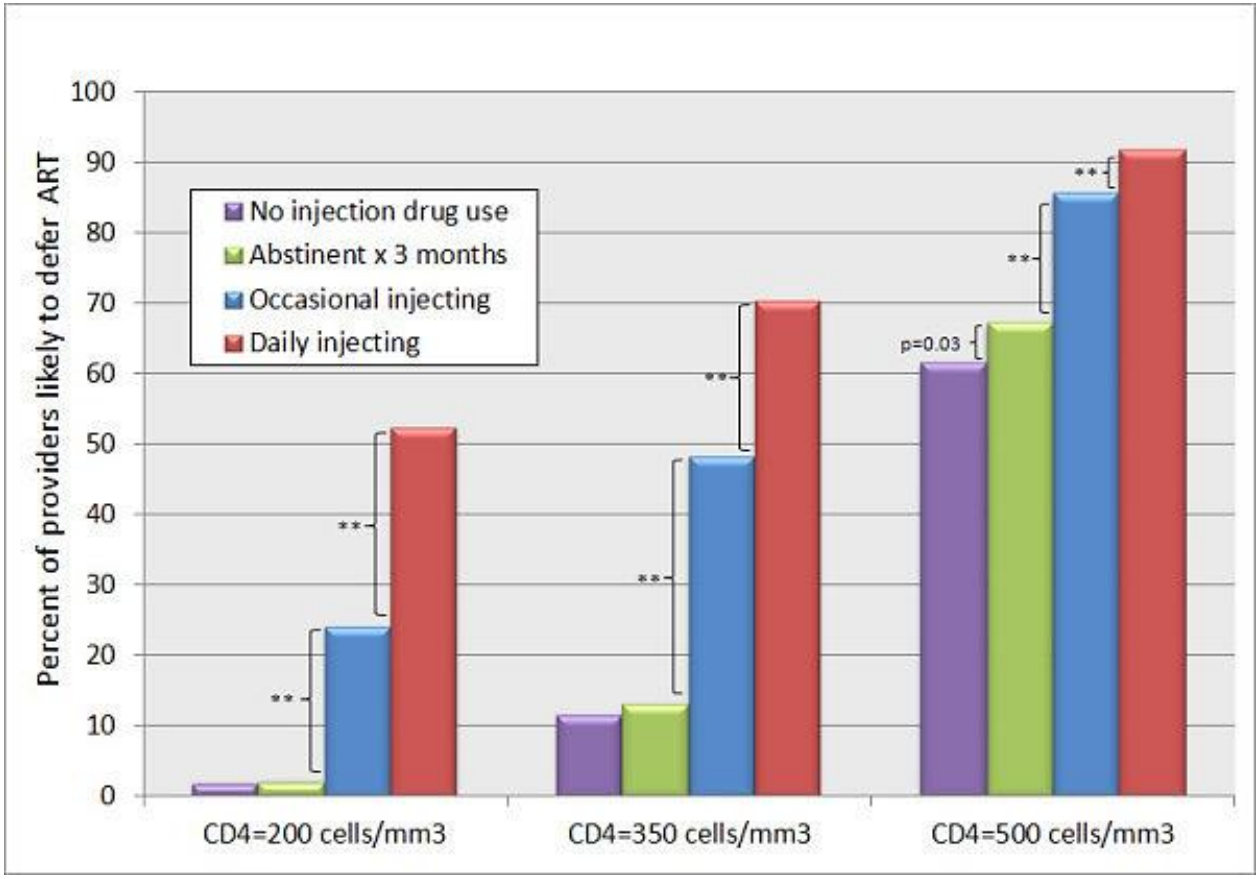
Substance Abuse Treatment Facilities Providing HIV Services: 2009



2009 SAMHSA National Survey of Substance Abuse Treatment Services (N-SSATS)

HIV+ IDUs Are Much Less Likely to Receive HAART

Percentage Of Providers Who Would Defer ART By CD4+ Count and Injection Drug Use Status



Westergaard RP et al., J Int AIDS Soc 2012; 15:10.

“Three Biggest” HIV Problems in US

- **Delays in Testing**
- **Delays in Care**
- **Early Drop out/Retention**

Mascolini, M. The three biggest HIV problems in the United States: Late testing, late care, and early dropout. Research Initiative: Treatment Action! 2011; 16:1-73.

IDUs HIV Care

- IDUs less likely to establish care, not to be LTFU, and remain in care

  (Yehia et al. JAIDS 2012 Jul 1;60(3):249-259)

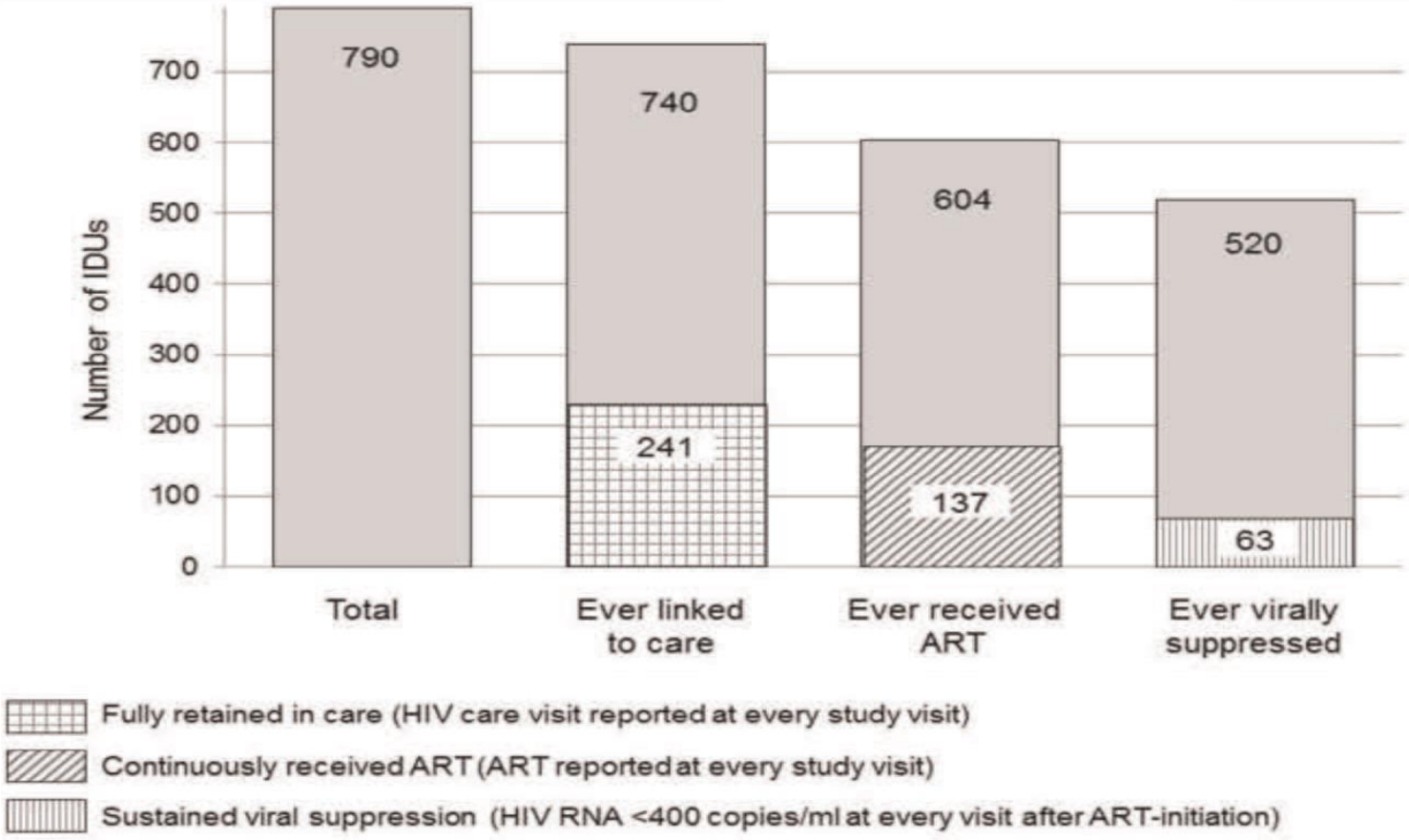
- IDUs less likely to show viral suppression

  (Yehia et al, JAMA 308, No. 4, 2012, 339-42)

- IDUs had lower retention in care; study of those diagnosed through 2008 and in care 2009

  (Hall et al. JAIDS 2012, 60(1), No. 1, 2012 77-82)

ALIVE Cohort: Viral Suppression among IDUs



Westergaard RP, Hess T, Astemborski J, Mehta SH, Kirk GD. AIDS 2013, Jun 13. [Epub ahead of print]

What is next?

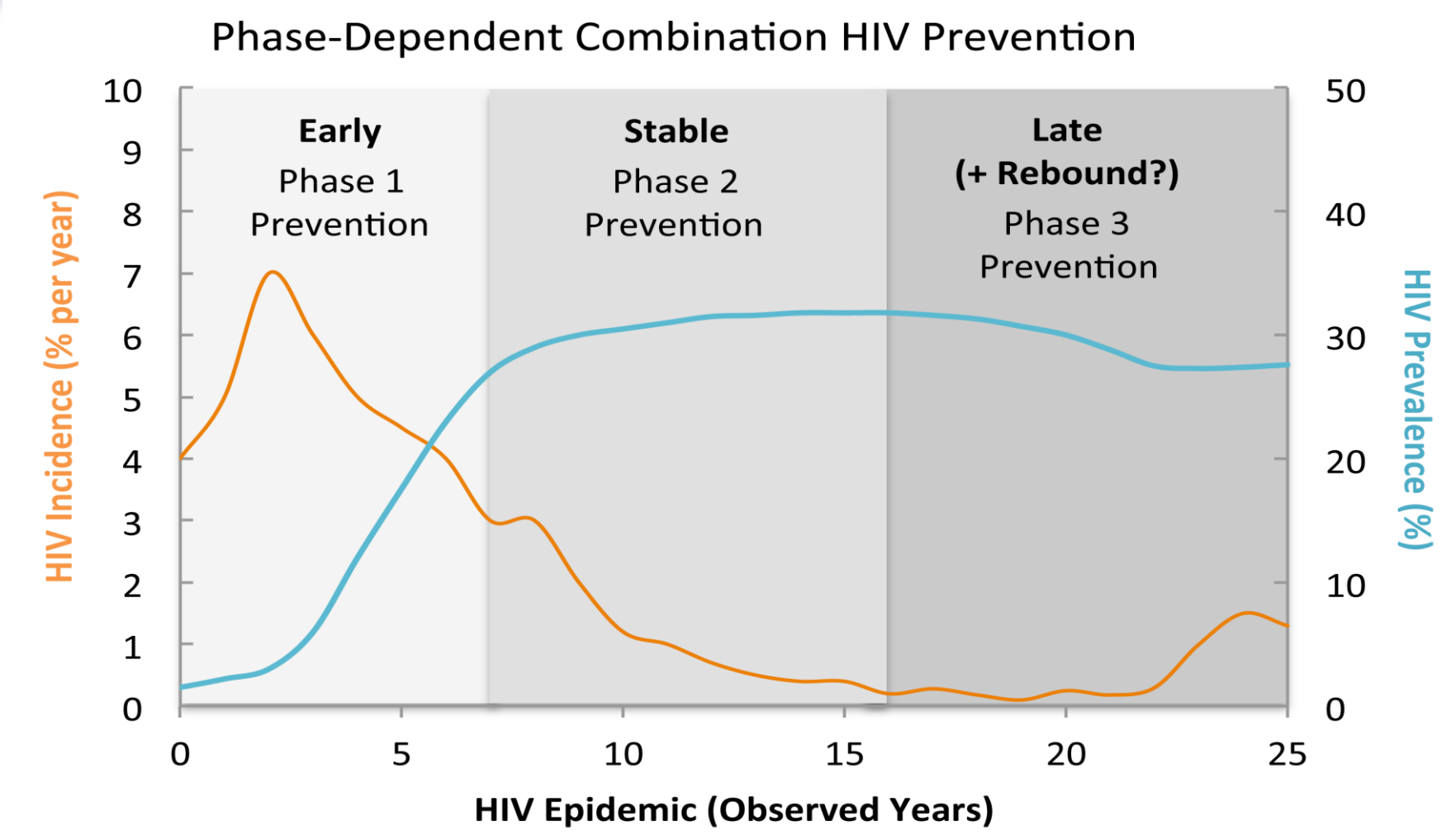
HIV Prevention Research: Guiding Principles

- Know your local epidemic (HIV Prevalence, incidence, and risk factors)
- No single prevention strategy is enough (Primary & Secondary Prevention)
- Both substance abuse treatment and HIV/AIDS treatment are needed to succeed when targeting substance abusers
- Be aware of local structural barriers when tailoring your combination of HIV prevention strategies

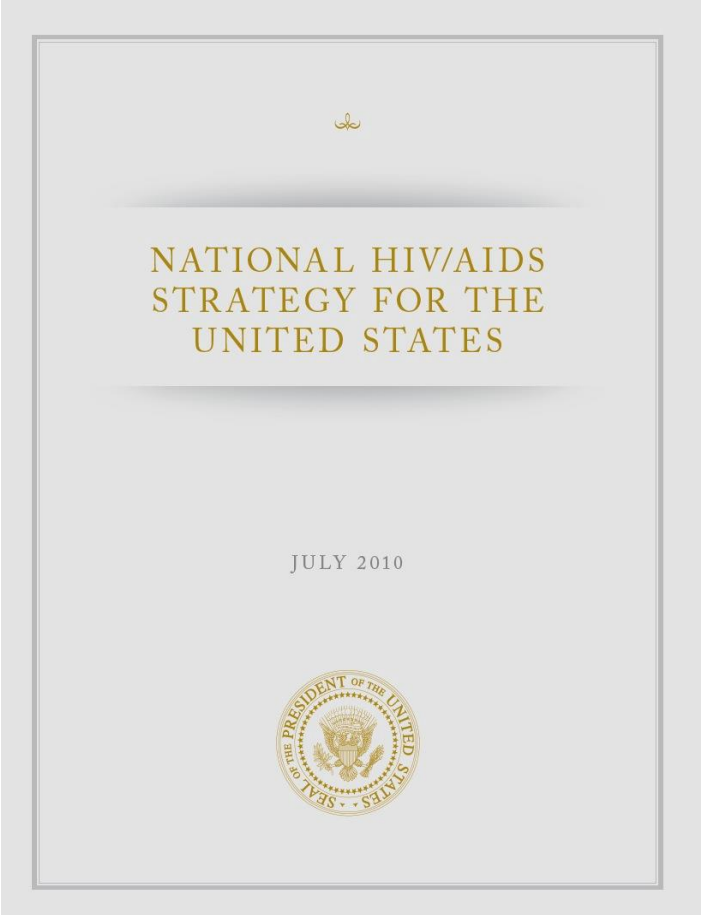
Optimizing HIV Prevention among Substance Abusers

- Selected interventions need to have been shown to be effective
- Potential synergies (target different path of transmission e.g., risk behaviors, avenues of transmission/acquisition and transmission)
- Feasibility of delivering at scale
- Acceptability to targeted population (impact uptake, adherence, & retention)

Temporal Dynamic Nature of HIV Epidemic

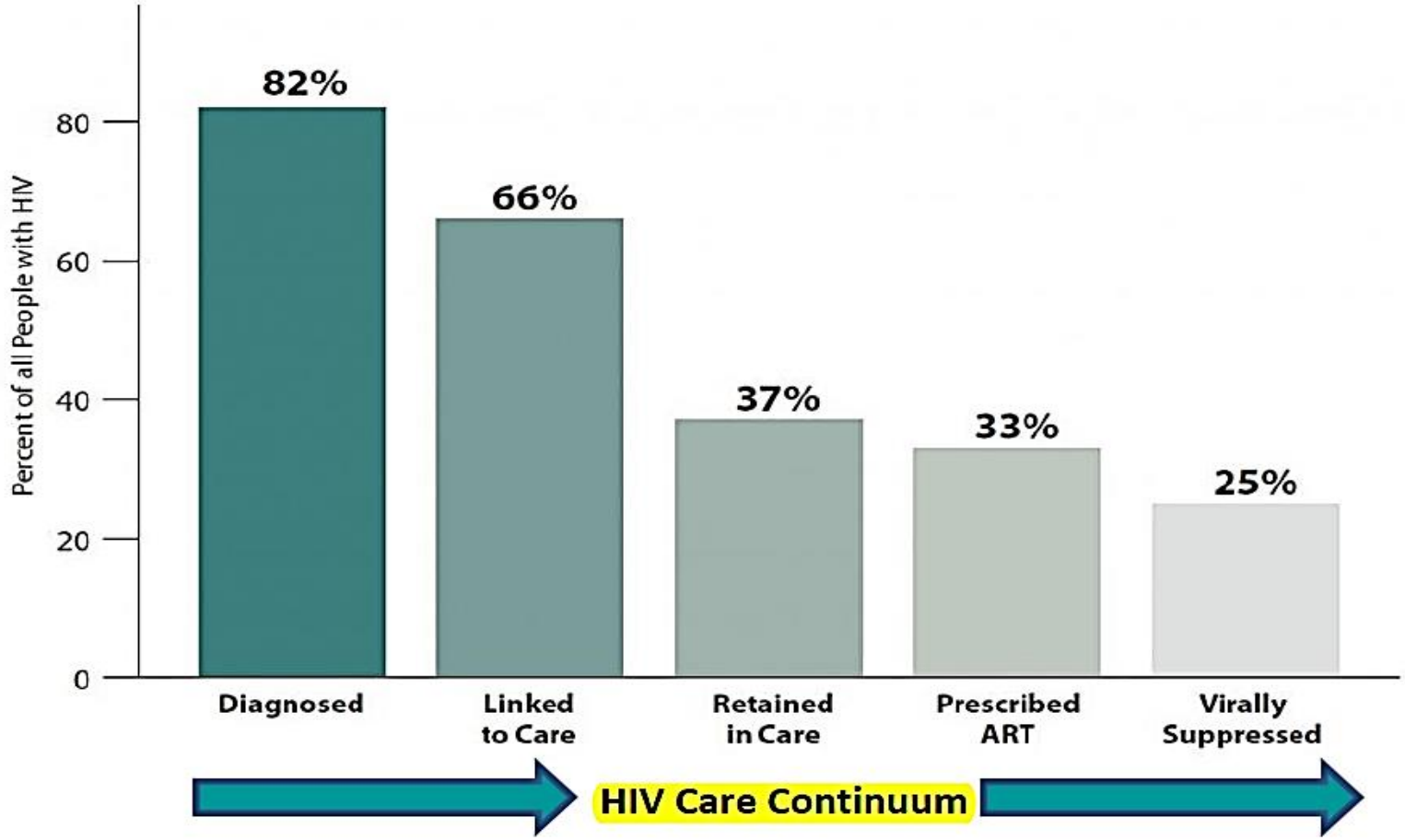


National Strategic Plan



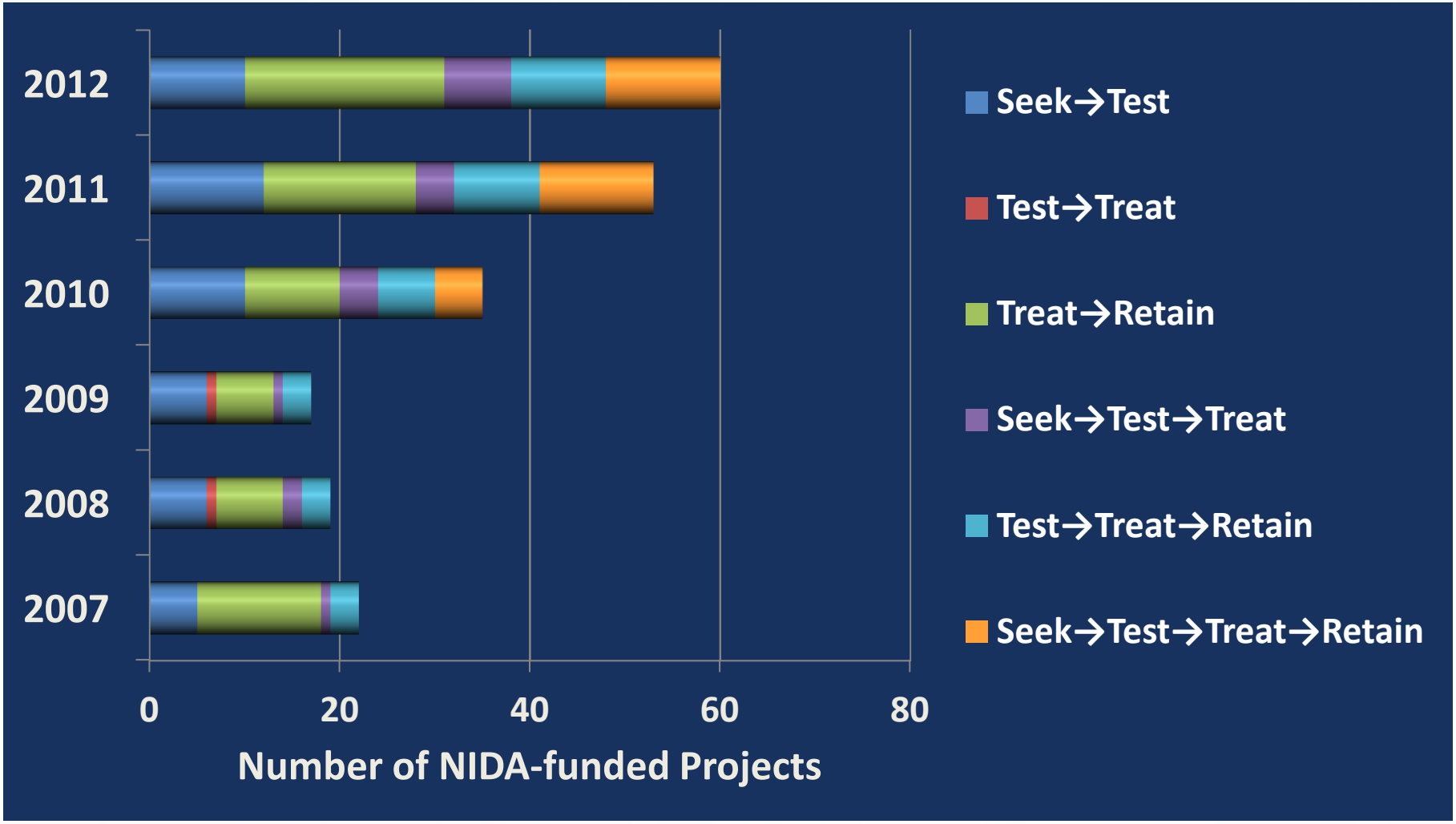
- **Reducing HIV incidence**
- **Increasing access to care and optimizing health outcomes**
- **Reducing HIV-related health disparities**

HIV Care Continuum

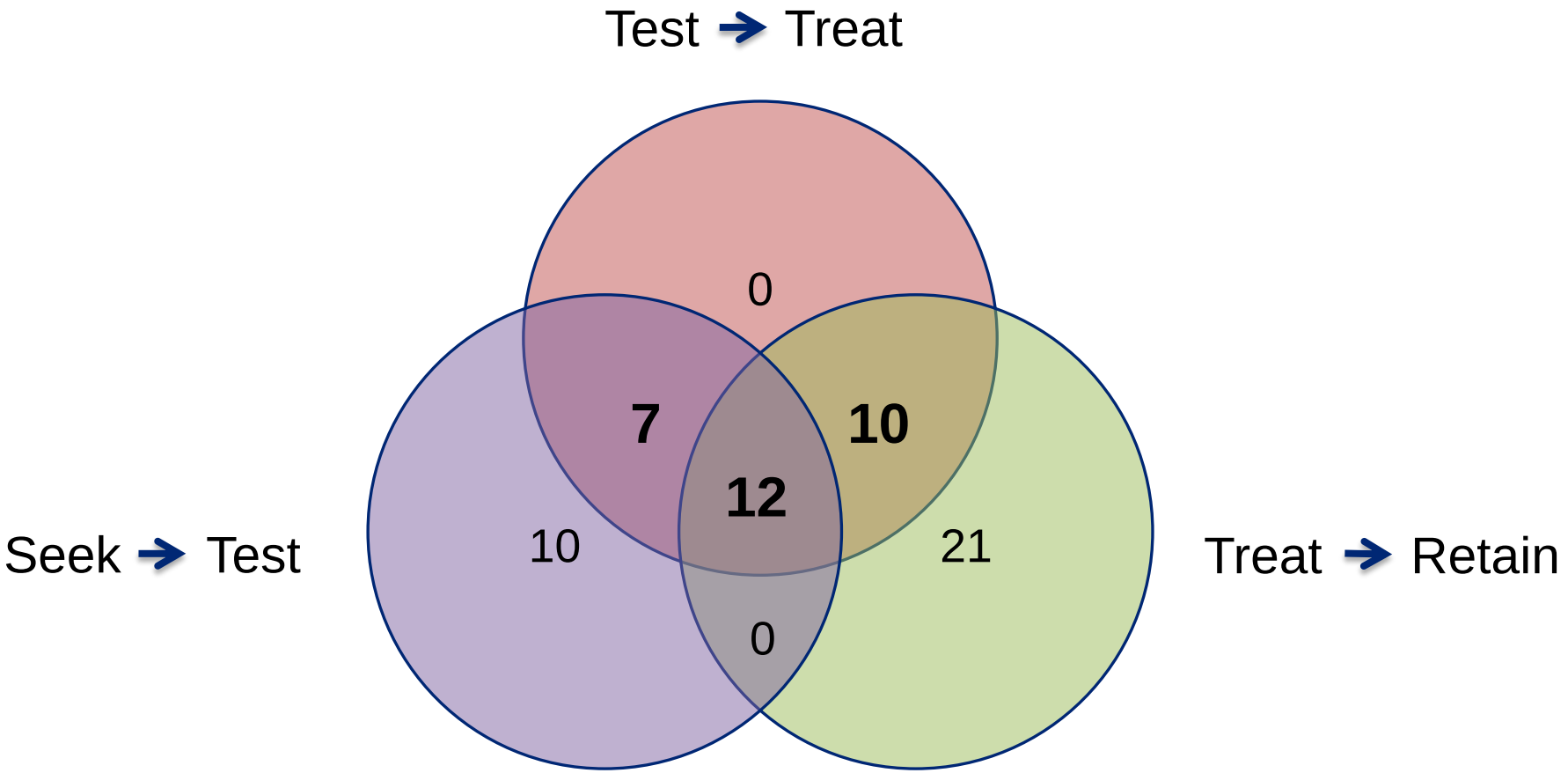


Source: http://www.aids.gov/federal-resources/national-hiv-aids-strategy/hiv-care-continuum-initiative-fact-sheet.pdf

Seek, Test, Treat and Retain Project Focus by Year



Active Seek, Test, Treat, and Retain Projects (2012)



Research Priorities and Initiatives

FY15 Priorities

- Promoting Retention in HIV Care
- HIV Prevention in Vulnerable Populations in the U.S.—Emphasis on youth, the Homeless and Black/African American Women and Young Black/African American Men
- Developing Comprehensive Interventions for Substance Using MSM
- Implementation Science Research
- Transformative Research
- Prevention and Treatment of HCV in those with and at Risk for HIV
- Enhancing Treatment as Prevention through Use of Incentives and Technology
- Training, Infrastructure, and Capacity Building

FY15 Initiatives

- Avant-Garde (DP1)
- A-START (R03/$100K)
- IAS/NIDA Fellowship ($75K)
- Advancing exceptional HIV/AIDS Research (R01/RFA)
- NIDA Drug Abuse and HIV Cohorts (PAR/U01)
- Novel Interventions PA (R34)
- HIV, Drugs, & Vulnerable Pop PA (R21, R01)
- Prevention and Treatment of HCV in Those with and at Risk for HIV PAR
- Promoting Retention in HIV Care PA
- AVENIR (AIDS) RFA (R01)

Area of growing concern: HCV

Background

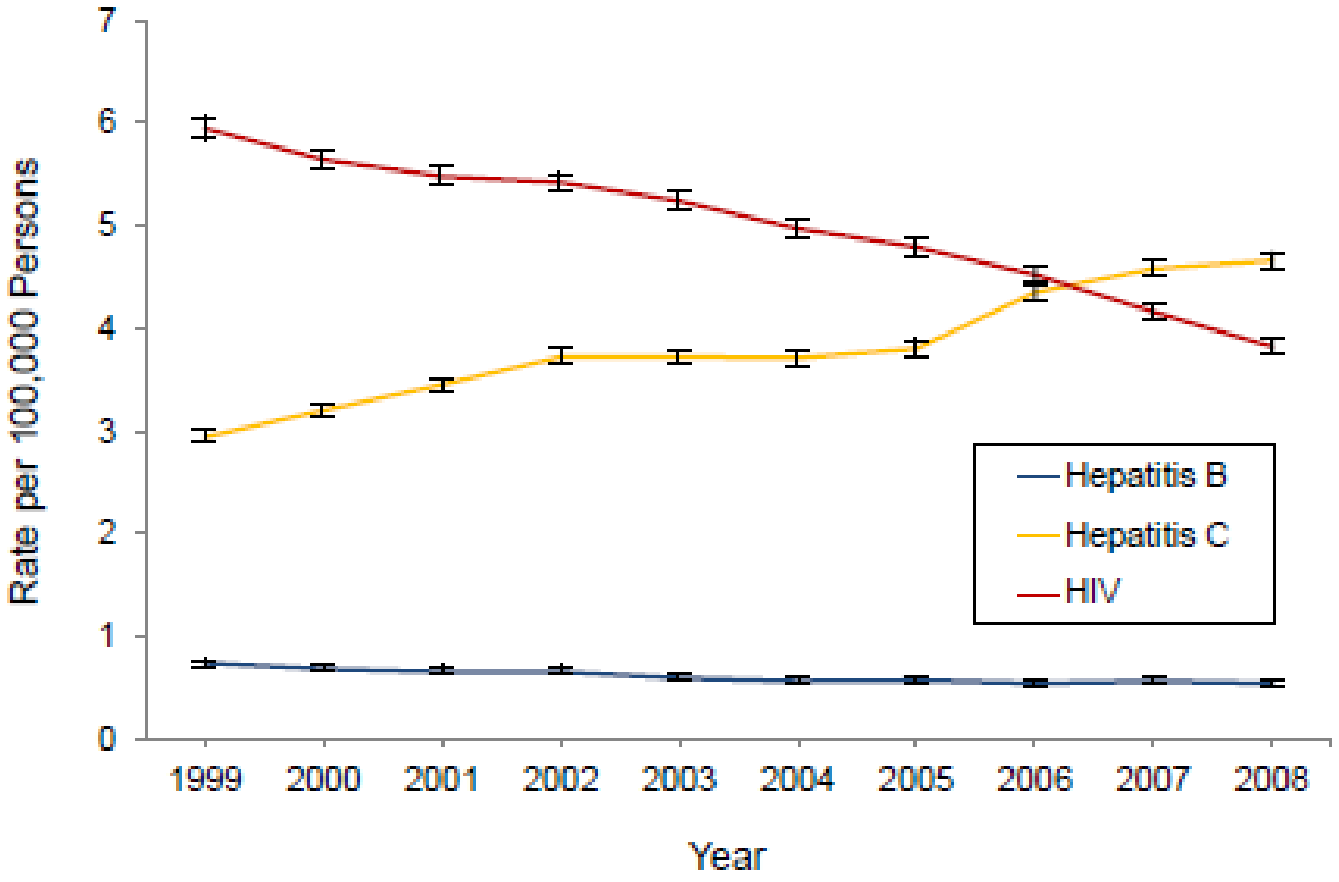
- Prevalence: 3.9 million live with HCV vs. 1.3 million with HIV
- Majority of new infections occur among people who inject drugs (80% new cases and 60% existing cases)
- New rapid test available (cannot distinguish between acute, chronic, resolved HCV)
- 75% unaware of serostatus

  IOM, 2010

- Since 2007: deaths associated with HCV (15,106) have surpassed deaths associated with HIV (12,734)

  Kathleen Ly et al. Annals Internal medicine, 2012.

Annual age-adjusted mortality, 1999-2008, >22m death records



K Ly et al, Ann Intern Med 2012; 156:271-8

Background (Cont.)

- Data from IFN-free direct-acting antiviral (DAA) therapy trials show:
  - Markedly reduced toxicity
  - High efficacy (90% cure)
  - Improved dosing schedules (once or twice daily)
  - Shortened treatment duration (6-24 weeks)

Gane, EJ et al. N Engl J Med 2013;368:34-44.

Poordad F, et al. N Engl J Med 2013;368:45-53.

Who is at Risk

Vulnerable Populations

- Older IDUs
- Young (15 to 24 yrs old) Non-urban injectors (started oxycodone)
- MSM (1.6 per 100 person/yrs especially high among HIV infected (6 time more likely)
- Criminal Justice (18% HIV+ go through CJS vs 40% HCV+)

Confronting the Emerging Epidemic of HCV Infection Among Young Injection Drug Users

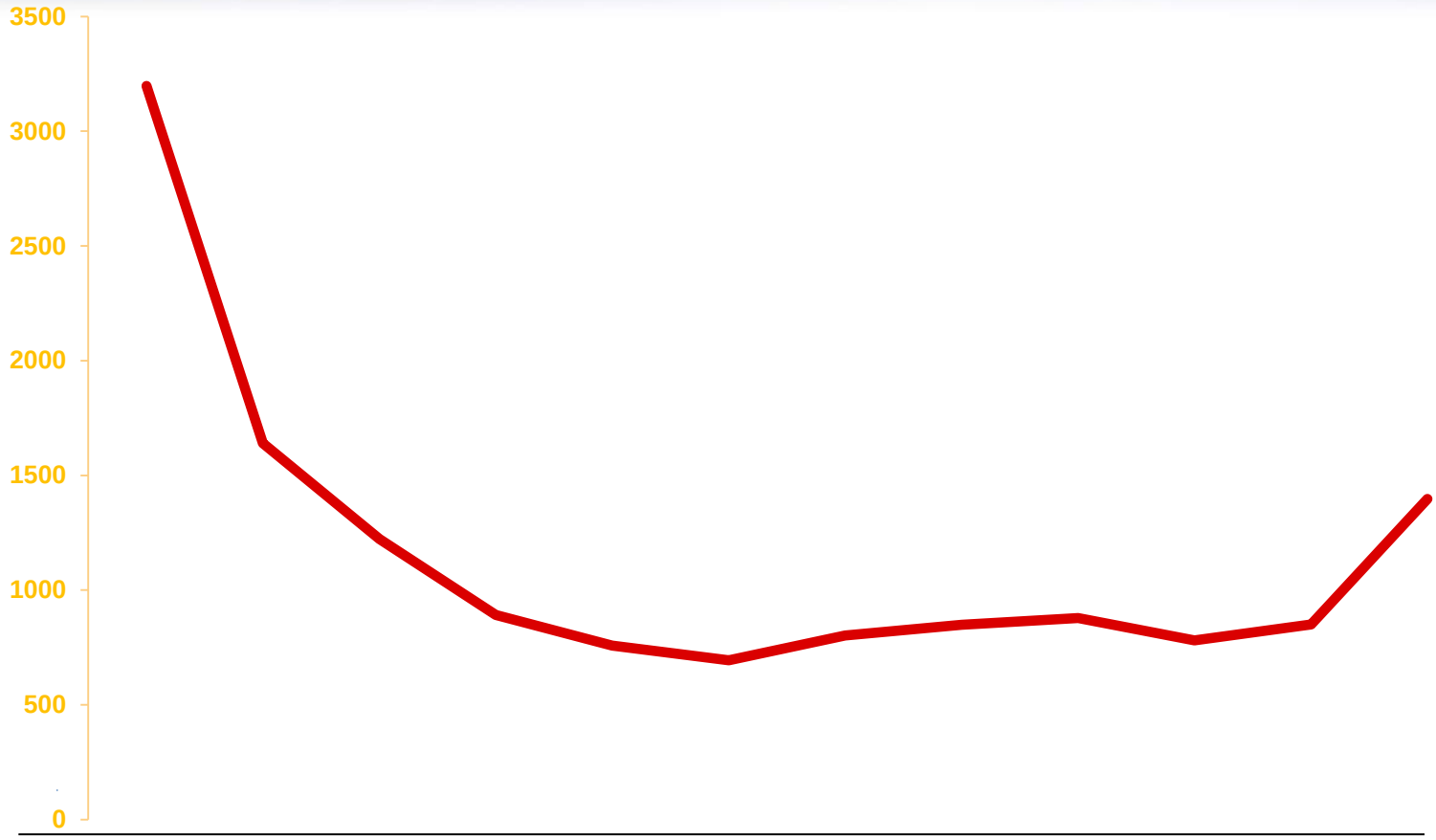
Ronald Valdiserri, MD, MPH, Jag Khalsa, PhD, MS, Corinna Dan, RN, MPH, Scott Holmberg, MD, MPH, Jon Zibbell, PhD, Deborah Holtzman, PhD, Robert Lubran, MPA, MS, and Wilson Compton, MD, MPE

Hepatitis C virus infection is a significant public health problem in the United States and an important cause of morbidity and mortality. Recent reports document HCV infection increases among young injection drug users in several US regions, associated with America's prescription opioid abuse epidemic. Incident HCV infection increases among young injectors who have recently transitioned from oral opioid abuse present an important public health challenge requiring a comprehensive, community-based response. We summarize recommendations from a 2013 Office of HIV/AIDS and Infectious Disease Policy convening of experts in epidemiology, behavioral science, drug prevention and treatment, and other research; community service providers; and federal, state, and local government representatives. Their observations highlight gaps in our surveillance, program, and research portfolios and advocate a syndemic approach to this emerging public health problem. (*Am J Public Health*. Published online ahead of print March 13, 2014: e1–e6. doi:10.2105/AJPH.2013.301812)

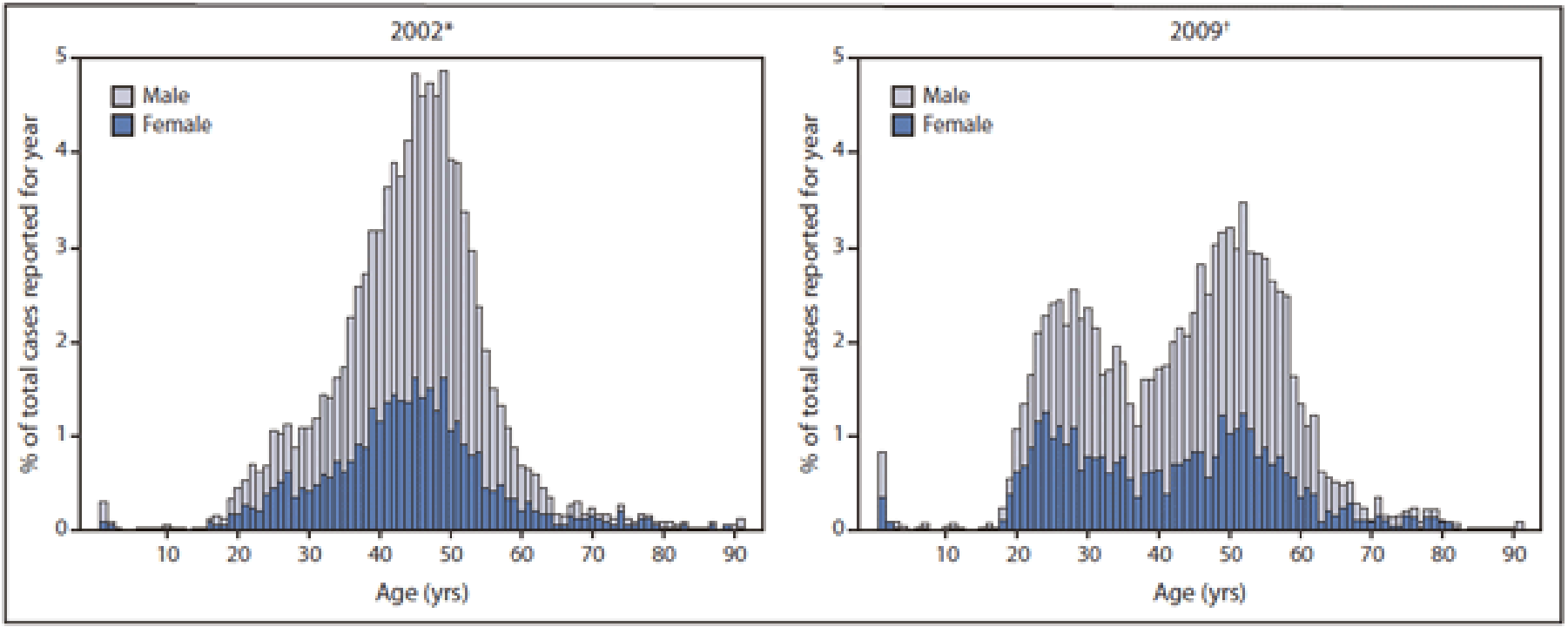
infected with HCV are often found in suburban and rural communities[9,10,13]—not just in urban settings—and that many of these young men and women report a history of oral prescription opioid abuse before the initiation of injection drug use.[10,12,14]

In fact, an important observation related to the discussion of emerging HCV infections among younger drug users is its temporal, geographic, and situational overlap with America's epidemic of prescription drug abuse. Over the past 2 decades, prescription drug abuse—the intentional use of a medication with intoxicating properties outside a physician's prescription[15]—has increased among youths

Reported Number of Acute Hepatitis C Cases — United States, 2000–2011



Age Distribution of Newly Reported Confirmed Cases of Hepatitis C Virus Infection – Massachusetts, 2002 and 2009



CDC: MMWR, May 6, 2011 vol 60 (17), p. 539

Trends Observed in Massachusetts, Wisconsin, Pennsylvania, and Florida

These young IDUs tend to be:

- young (aged 20-29)
- white
- equally male:female
- *non-urban* (suburban, rural)
- previous ‘Oxycontin’ users

Slide courtesy of Dr. S. Holmberg, CDC

Summary: Characteristics of "traditional" vs. "new/recent" IDUs

Characteristic	"Traditional" HCV-infected IDU	"Recent" HCV-infected IDU
Age	mixed, 18-50 yo	young, usu. <25 yo
Location	urban	non-urban, rural
Gender	mainly male	male ≅ female
Race/ethnicity	minority	white
Transition?	{heroin→} heroin	oral prescription opioids → heroin
Prevalence	"stable"/decreasing	"unstable"/increasing
Ability to locate	difficult	even more difficult

Slide courtesy of Dr. S. Holmberg, CDC

Prevention

HCV Prevention

- Traditional HIV Prevention not very efficient
- TasP (STTR)
- Drug abuse Tx as HCV prevention
- Better integration of Addiction MD and ID
- Vaccine
- Need combination strategy

TasP for HCV: Vietnamese Model

"We showed in one treatment scenario that for every 100 patients started on treatment (of whom we expect 65% would be cured), 94 new infections could be averted…We demonstrated these effects in the context of low coverage with harm reduction interventions (MMT and NSE), as currently observed in Vietnam, and show that expansion of these services would offer additive preventive benefits to an HCV treatment program."

Nicolas Durier et al. PLoS ONE April 2012 vol 7 e34548

Combination Interventions Among IDUs

Modeling the impact of antiviral treatment, needle exchange programs, and opiate substitution therapy on HCV prevention

Large reductions (>45%) in HCV chronic prevalence over 10 years require HCV antiviral treatment. Scaling up OST and NEP substantially reduces the treatment rate required to achieve specific HCV prevalence reductions. Combining antiviral treatment with OST with NEP is critical for achieving substantial reductions (>50%) in HCV chronic prevalence over 10 years.

Martin, NK. Et al., CID 2013:57, S39-S45

HCV TasP

Different TasP (STTR) strategies needed for vulnerable populations:

- Seeking
- Testing (key)
- Engaging in Tx
- Retention and adherence

Potential Barriers to HCV TasP

- Reinfection rate in IDU is low (1 to 5% per year)

  Grady, BP., et al. CID, 2013, 57 suppl2, S105-S110

- Reinfection among HIV+ is high (over 1 in 4 within 2 years)

  Martin, T. et al. 7th IAS conference on Pathogenesis, Treatment and Prevention 2013.

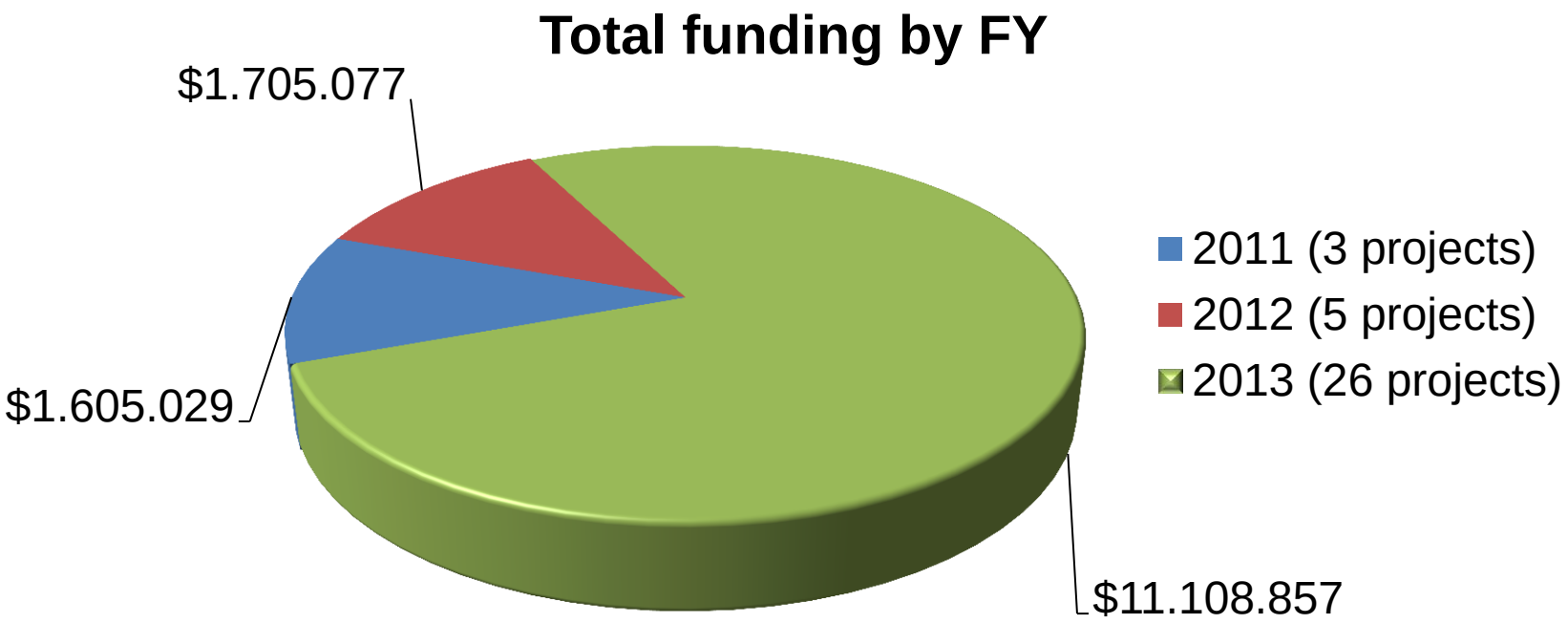
Research Priorities to Address Knowledge Gaps (I)

- Better definition of the scope of the problem (epi research)
- Methods to identify and reach young persons who have not yet transitioned from oral to injection opioid use
- Additional research on transmission risks associated with sharing drug preparation equipment and environmental contamination
- Longitudinal cohort studies of young IDUs to better define HCV re-infection risk

National Consultation on HCV among Young IDUs, February 26-27, 2013

NIDA Active HCV portfolio

$14,418,963 funding 33 active HCV projects



NIDA FY15 FOA

PA (R01):

Prevention and Treatment of HCV in Those with and at Risk for HIV PAR

Topics Under Consideration

- Cascade of Care Retention Gap
- Combination HIV Prevention Strategy
  - Implementation science approach
- Alcohol, drug abuse, and HIV
  - Functional collaboration with NIAAA
- Integrating care: ID and addiction medicine
- Research toward a cure among drug users



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