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Objectives

- Briefly Characterize the magnitude of the drug use and HIV problem
- Review what was found to be effective as HIV Prevention Strategies for Drug Users
- Recommendations for making progress in reducing HIV transmission among drug users
- NIDA Recent and upcoming Initiatives
Global Epidemiology

- Injecting drug use was identified in 148 countries
- An estimated 15.9 million people inject drugs worldwide
- Largest numbers of IDU: China, the USA, and Russia:
  - Estimates of HIV prevalence among IDU 12%, 16%, and 37%, respectively
- HIV prevalence among injecting drug users was 20–40% in 5 countries and over 40% in 9.
- Worldwide, about 3.0 million people who inject drugs are HIV+

Estimated # of new infections in US by Transmission Category


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

- IDU accounted for 12% (6,600) of estimated 56,300 new HIV infections (2006). IDU and MSM accounted for another 4% of new infections.
- People infected through IDU (204,600) accounted for 19% of all 1.1 M people living with HIV in 2006 – 16% of men (131,500 persons) and 26% of women (73,100 persons) with HIV infected by IDU.

Source: JAMA, August 6, 2008;300:520; MMWR, 2008;57(39):1073-7
Convergence of HIV prevalence Among IDU and Non-IDU

Non-injecting drug use is an important factor contributing to HIV infection

US Epidemiology


- Late HIV diagnosis is common among IDUs although HIV testing is relatively high.

- Rates of meth use among MSM is 22.5 times higher than the general population and HIV incidence is 40 times higher.
HIV Prevention Efficacy
Needle Exchange Program (NEP) effectiveness

- GAO (1993)
- CDC & USCF (Lurie et al., 1993)
- NRC/IOM, (Normand et al., 1995)
- NIH Consensus Statement, (1997)
- DHHS, NEPs when part of a comprehensive 
Community Outreach

- Early strategy to reach out-of-treatment IDU (MMWR, 1990, 39(31), 529, 536-538)

- Relied on peers to initiate education and support to reduce injection, sexual risk behaviors, encouraged HIV testing, and entry into drug abuse treatment

**Drug Abuse Treatment is an Effective HIV/AIDS Prevention Strategy**

**HIV Seroconversion at 18 Months By Receipt of Treatment**

<table>
<thead>
<tr>
<th>Treatment Status</th>
<th>Rate of Seroconversion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment</td>
<td>22</td>
</tr>
<tr>
<td>Partial treatment</td>
<td>4.4</td>
</tr>
<tr>
<td>Continuous treatment</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Drug Abuse Tx as HIV Prevention

- Oral opioid substitution therapy and naltrexone are associated with reduction of drug risk behaviors, lesser effect on sex risk behaviors (Gowing, L. et Al. Cochrane Database Sys. Rev. 2008, 2; Metzger et al. JAIDS 2010 55 supp 1)

- Stimulant abuse tx reduces HIV-related sexual risk behaviors, decreases # of partners (Shoptaw et al. J Addict Dis 1998, 17, 19-32)

- WHO collaborative study found OST as effective in low and middle income as in high income countries in reducing drug use and HIV injection risk (Lawrinson et al. Addiction 2008, 103: 1484-92)
Drug Abuse Tx and ART

- OST (MMT or buprenorphine) duration predicts virologic success (Roux, P. et al. CID 2009, 49:1433-40)

- MMT enhanced ART adherence in HIV/HCV IDU and decreased viral load (Palepu, A. et al. DAD 2006, 84:188-94)

HAART as HIV Prevention

Lancet 2006; 368: 531-36

The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic

Julio S G Montaner, Robert Hogg, Evan Wood, Thomas Kerr, Mark Tyndall, Adrian R Levy, P Richard Harrigan

“The upshot of this widespread failure to recognize that AIDS is an exceptional crisis and threat is that the response to the pandemic is not made commensurate to the challenges—and so the epidemic escalates even while it erodes our capacities to check it.”

Dr Peter Piot, UNAIDS Executive Director

HAART and HIV prevention

HAART and HIV prevention

Continuing expansion of the HIV/AIDS pandemic has been recognized as an exceptional challenge to global health. We have seen the rapid increase in HIV/AIDS cases and the displacement of data on the epidemic. The uncontrolled spread of HIV/AIDS has led to a rapid decline in life expectancy in many countries. The AIDS epidemic is now the largest cause of death in the world, with more than 2 million people dying each year from AIDS.

HIV causes AIDS. The transmission of HIV from infected to uninfected people through exposure to an HIV-infected cell can lead to AIDS. The virus infects CD4+ T cells, which are a type of white blood cell that helps the immune system fight infections. Once infected, CD4+ T cells multiply and spread throughout the body, weakening the immune system and making it more difficult for the body to fight off infections. As the number of CD4+ T cells decreases, the risk of developing AIDS increases.

The spread of HIV/AIDS can be prevented through the use of antiretroviral therapy (ART). ART is a combination of medications that can slow the growth of HIV in the body and help to prevent the progression of the disease to AIDS. The use of ART has been shown to reduce the risk of acquiring new HIV infections and to improve survival rates for people living with HIV.

In conclusion, the expansion of access to ART is crucial in the fight against the HIV/AIDS pandemic. It is important that we continue to prioritize the expansion of ART programs and work towards ensuring that everyone who needs ART has access to it.
Treatment prevents morbidity, mortality and transmission.

With regard to transmission, reductions in community viral load due to the expansion of HAART coverage has been associated with decreasing number of new HIV diagnoses in Taiwan; Vancouver, Canada; and San Francisco, USA.

Recently researchers in Baltimore have shown using data from the ALIVE cohort that reductions in community viral load and population-level HAART uptake were strongly associated with declines in HIV incidence. These data strengthen evidence supporting Seek, Test, Treat and Retain strategy as an efficient HIV prevention modality to prevent HIV in IDU communities.
Decreased HIV Transmission after a Policy of Providing Free Access to Highly Active Antiretroviral Therapy in Taiwan

Chi-Tai Fang, Hsu-Mei Hsu, Shiing-Jer Twu, Mao-Yen Chen, Yu-Yin Chang, Jing-Shiang Hwang, Jung-Der Wang, Che-Yen Chuang, and the Division of AIDS and STD, Center for Disease Control, Department of Health, Executive Yuan

1Department of Internal Medicine, National Taiwan University Hospital, 2Department of Health, Executive Yuan, and 3College of Public Health, National Taiwan University, and 4Institute of Statistical Science, Academia Sinica, Taiwan

Background. Taiwan established a nationwide surveillance system for human immunodeficiency virus (HIV) infection in 1989 and adopted a policy to provide all HIV-infected citizens with free access to highly active antiretroviral therapy (HAART) beginning in April 1997. This provided an opportunity to determine the effect of the widespread use of HAART on the evolution of the HIV epidemic.

Methods. We analyzed national HIV surveillance data. The HIV transmission rate was estimated by use of an exponential model of HIV epidemic evolution, with statistical projection over the interval between infection and detection to fit the surveillance data.

Results. By the end of 2002, the cumulative number of HIV-infected citizens in Taiwan had reached 4390 (0.019% of the total population). After free access to HAART was established, the estimated HIV transmission rate decreased by 53% (0.391 vs. 0.184 new cases/prevalent case-year [95% confidence interval, 31%-65%]). There was no statistically significant change in the incidence of syphilis, in the general population or among HIV-positive patients, during the same period.

Conclusion. Providing free HAART to all HIV-infected citizens was associated with a 53% decrease in the HIV transmission rate and contributed to the control of the HIV epidemic in Taiwan.
Longitudinal community plasma HIV-1 RNA concentrations and incidence of HIV-1 among injecting drug users: prospective cohort study
Figure 1: Number of active HAART participants and number of new HIV diagnoses per year in British Columbia, Canada, 1996–2009. p values are for trend and were obtained from the generalised additive model. Injecting drug user (IDU) refers to individuals who have ever injected illicit drugs. HAART=highly active antiretroviral therapy. BC=British Columbia. NA=not available.
ALIVE, 1988-2008

Recent Initiative on Tx as Prev

- Seek, Test, and Treat in Criminal Justice System FY11 $10M a yr for 5 yrs

- Seek Test and treat among Vulnerable Populations FY12 $8M a yr for 5 Yrs

HPTN 052 Proof of concept (Rome and NEJM July)
Components of a comprehensive HIV prevention strategy

- Drug treatment as HIV prevention
- ART as HIV prevention
- Community-based outreach
- Syringe Access: NEPs and pharmacy access
- Sexual Risk Reduction (Condom Use)
- Supervised Injection Rooms
- PrEP/Microbicides and PEP
- Male Circumcision
- Prevention and Treatment of STI
- Mother-to-Child Transmission
Combination Approach to HIV Prevention for Drug Users
Combination Approach

- Scientific evidence clearly shows that a variety of interventions can prevent HIV transmission.

- Combination of prevention strategies adapted for specific context is our best hope for eliminating HIV transmission among drug users.
How to Combine Strategies?

- Implementation science will give us the answer.

- Need to carry out implementation science in an efficient manner e.g., Harmonization across stand alone projects.
Recent Initiatives on Combination & Implementation science

- PEPFAR/NIDA Collaboration
  - Effectiveness of Combination Approaches to HIV Prevention
- PEPFAR/NIH Collaboration
- PEPFAR USAID Collaboration
- PEPFAR CDC Collaboration
London School of Hygiene and Tropical Medicine Partner with NIAID/HPTN to evaluate linking household-based testing to universal community-based HIV treatment in Zambia and South Africa
Johns Hopkins will evaluate the impact of an integrated set of biomedical, behavioral, and structural prevention interventions to reduce HIV incidence in Tanzania.
Harvard School of Public Health will evaluate the impact on HIV incidence of expanding population coverage of an integrated set of HIV prevention in Botswana.
NIDA/PEPFAR IS RFA: Targeting Drug Using Populations

- **Purpose**
  - Implementation science projects that will inform PEPFAR as they develop more effective and cost effective methods to deliver HIV prevention, treatment, and care for drug using populations

- **Funds Available and Anticipated**
  - NIDA intends to commit $4M to fund 8-10 awards in FY12
  - NIDA/PEPFAR RFA ($US 20 million over 5 years, NIDA resources)
Applications

- 22 applications reviewed (November 15)
  - **Africa** - Kenya (1), Tanzania (2), Mozambique (1), Ghana (1), Ethiopia (1), Nigeria (1),
  - **Central Asia** - Kazakhstan (1)
  - **Eastern Europe** - Ukraine (2), Russia (3)
  - **Southeast Asia** - Vietnam (5), Indonesia (1), Cambodia (1)
  - **EAST ASIA** - China (1)
  - **North America** - Mexico (1)
Hot topics

- Towards a cure Latent virus/reservoirs
  - IAS/OAR initiative
  - NIDA: Sekaly, Morgolis, Verdin, Karn
- Tx as Prevention HPTN 052
- Seek test and treat
- PrEP
- Implementation science/combination
Needed New Tools

- Long Lasting Pharmacotheries
  - Vivitrol
  - Depot Buprenorphine
  - Heroin Vaccine
  - Cocaine Vaccine

- Developing therapeutic to cure HIV/AIDS (getting at the latent virus)

- Developing an efficient preventive Vaccine for HIV

These will be useful but will not eradicate HIV among drug users without Governments’ commitment
Recent Publication

Профилактика и лечение ВИЧ/СПИДа у потребителей наркотиков: глобальная перспектива

Консультативная встреча состоялась при поддержке Национального института наркологии и Международного общества по СПИДу
11-12 января 2010 г.
Вашингтон
www.iiasociety.org

International AIDS Society
NIDA AIDS Research Program

PREVENTION AND TREATMENT OF HIV/AIDS AMONG DRUG USING POPULATIONS: A GLOBAL PERSPECTIVE

Guest Editors: Alya D. Yolken, M.D. and Jacque L. Norman, M.D.

- Associated High-Risk Behaviors and Drug Use Among HIV-Positive Drug Users to Improve Individual and Public Health Outcomes
- Epidemiology (HIV) Between Drug Use and HIV Infection: An International Perspective
- HIV Among People Who Use Drugs: A Global Perspective of Populations at Risk
- Toward a Comprehensive Approach to HIV Prevention for People Who Use Drugs

Oxford University Press
Avant-Garde Award

This 5-year, $2.5M award is designed to support individual scientists of exceptional creativity who propose cutting-edge and transformative approaches to major challenges in biomedical and behavioral research on drug abuse and HIV/AIDS. Open to applications from U.S. and foreign institutions.

2010
Dr. Eric Verdin
Gladstone Institutes
New methods to detect and model HIV latency

2011
Dr. David Ho
Aaron Diamond AIDS Research Center
Develop a HIV therapeutic vaccine

2009
Dr. Benjamin Chen
Mt. Sinai School of Medicine
Visualizing early events of parenteral HIV transmission (cell-cell vs. free virus)

2009
Dr. Dana Gabuzda
Dana Farber Cancer Institute & Harvard Medical School
Control of T cell restoration in HIV-infected IV drug abusers

2008
Dr. Ileana Cristea
Princeton University
Quantifying HIV–host interactome and regulation of gene expression

2008
Dr. Jerame Groopman
Beth Israel Medical Center & Harvard Medical School
Blocking HIV transmission at the immune synapse

2009
Dr. Jerome Groopman
Beth Israel Medical Center & Harvard Medical School
Blocking HIV transmission at the immune synapse

2009
Dr. Jonathan Karn
Case Western Reserve University
Developing strategies for long-term HIV suppression

2009
Dr. Rafick-Pierre Sekaly
Vaccine & Gene Therapy Institute, FL
Novel pathways for purging the HIV reservoir

2008
Dr. Julio Montaner
University of British Columbia
HIV treatment as prevention in drug using populations
Thank You

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www.drugabuse.gov/AIDS