

# HIV/AIDS in 2007: A Brief Overview

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May 8, 2007

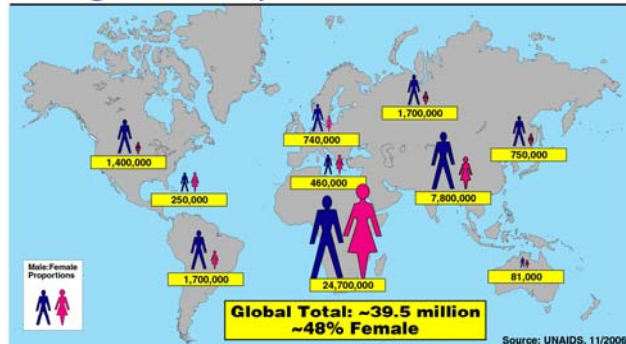


CENTERS FOR DISEASE CONTROL  
**MMWR**  
MORBIDITY AND MORTALITY WEEKLY REPORT

June 5, 1981  
***Pneumocystis Pneumonia -  
Los Angeles***

July 4, 1981  
***Kaposi's Sarcoma and  
Pneumocystis Pneumonia Among  
Homosexual Men -  
New York City and California***

## Adults and Children Estimated to be Living with HIV, 2006



## Global HIV/AIDS Estimates, 2006

- People living with HIV 39.5 million  
– incl. 2.3 million children <15 years
- New HIV infections in 2006 4.3 million  
– incl. 530,000 children <15 years
- Deaths due to AIDS in 2006 2.9 million  
– incl. 380,000 children <15 years

Source: UNAIDS, 11/2006

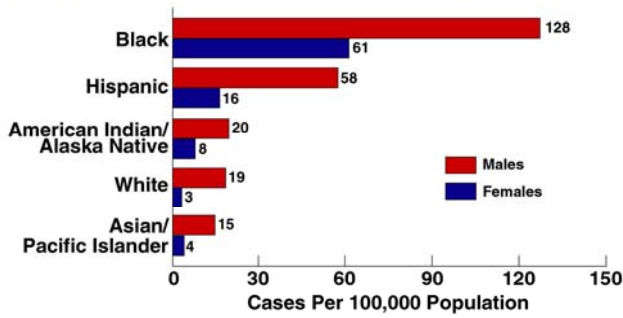
## Recreational Drug Use and HIV Infection

- ~1/3 of incident HIV infections outside Sub-Saharan Africa due to injection drug use (UNAIDS, 2006)
- Many non-injected recreational drugs (including alcohol) contribute to risk of sexual HIV transmission
  - psychological, physiological, immunological effects

## HIV/AIDS in the United States - Current CDC Estimates

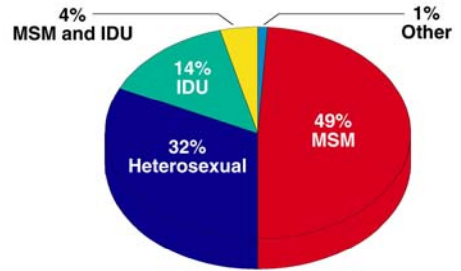
- 988,376 cumulative AIDS diagnoses through 2005.
- 550,394 cumulative AIDS deaths through 2005.
- ~ 1.1 million U.S. residents living with HIV infection; 25% unaware of their infection.
- 40,000 new infections annually, unchanged in > 10 years.

## Estimated Rates of HIV Diagnoses (Regardless of Stage of Disease), USA, 2005



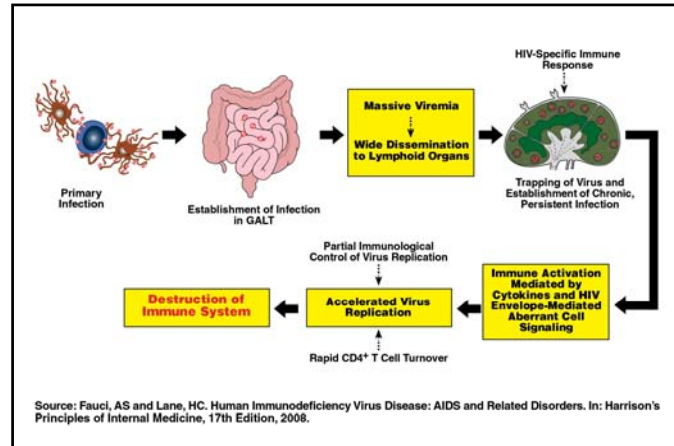
Source: CDC. Estimates based on data from 33 states with long-standing, confidential, name-based HIV reporting.

## Transmission Categories of Persons Diagnosed with HIV (Regardless of Stage of Disease), USA, 2005



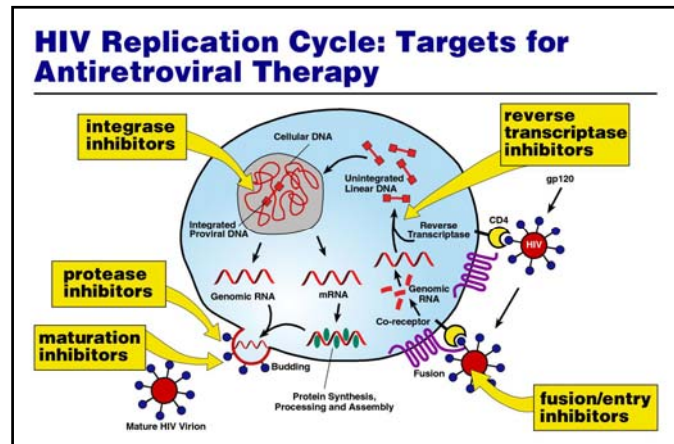
Source: CDC. Estimates based on data from 33 states with long-standing, confidential, name-based HIV reporting.

# Pathogenesis of HIV Infection

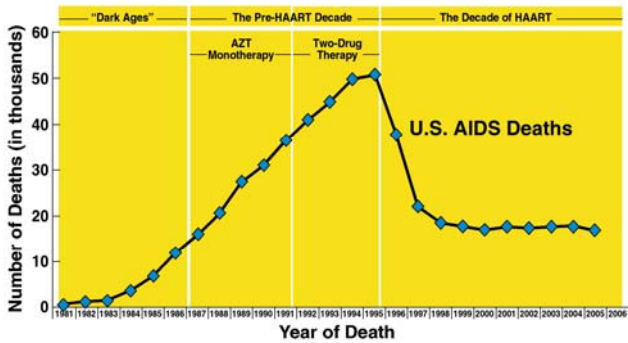


Source: Fauci, AS and Lane, HC. Human Immunodeficiency Virus Disease: AIDS and Related Disorders. In: Harrison's Principles of Internal Medicine, 17th Edition, 2008.

# Treatment of the HIV-Infected Individual



## 25 Years of AIDS Therapy: the "Dark Ages", the Pre-HAART Decade, and the Decade of HAART



## FDA-Approved Antiretroviral Drugs

### NRTI

- Abacavir
- Didanosine
- Emtricitabine
- Lamivudine
- Stavudine
- Zidovudine
- Zalcitabine
- Tenofovir

### NNRTI

- Delavirdine
- Efavirenz
- Nevirapine

### Fusion Inhibitor

- Enfuvirtide (T-20)

### PI

- Amprenavir
- Atazanavir
- Fosamprenavir
- Indinavir
- Lopinavir
- Nelfinavir
- Ritonavir
- Saquinavir
- Tipranavir
- Darunavir (TMC114)

### Combinations

- 5 available, combining 2 or 3 drugs
- e.g. Atripla: efavirenz + emtricitabine + tenofovir

## AIDS Drugs Have Saved 3 Million Years of Life in the United States

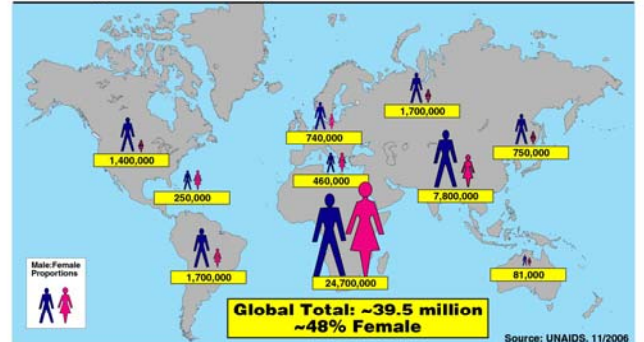
July 1, 2006  
Volume 194

The Journal of  
Infectious  
Diseases

### The Survival Benefits of AIDS Treatment in the United States

RP Walensky et al.

## Adults and Children Estimated to be Living with HIV, 2006



## Examples of Programs Providing HIV/AIDS Prevention, Treatment and Care to Developing Nations

- President's Emergency Plan for AIDS Relief (PEPFAR)
- Global Fund to Fight AIDS, Tuberculosis and Malaria
- Philanthropies and NGOs (e.g. Gates Fdtn., Clinton Fdtn., MSF)



## Global Access to Antiretroviral Drugs in Low and Middle Income Countries is Improving

12/2002: 300,000 people on ARVs

12/2006: >2 million people on ARVs

- However, only 28% of people (15% of children) in need of ARVs in low- and middle-income countries are receiving them.

Source: WHO, 4/2007

# Newsday

April 10, 2001

## To Fight AIDS, Use Both Treatment and Prevention

### Approaches to HIV Prevention

- Education and behavior modification
- Condoms, other barrier methods
- Treatment/prevention of drug/alcohol abuse
- Clean syringes (i.e. "needle exchange" programs)
- Interruption of transmission from mother to child
- Prophylactic antiretroviral therapy
- Treatment of other sexually transmitted diseases
- Topical microbicides
- Circumcision
- Vaccination

### The Need for Topical Microbicides

- Most HIV infections are spread by unprotected sex.
- Current methods are male controlled and contraceptive.
- Women have no means to protect themselves if their partners do not use male condoms or allow female condoms to be used.
- Abstinence and being faithful are not likely to protect married women or those who are sexually abused.

### Adult Male Circumcision Significantly Reduces Risk of Acquiring HIV

#### THE LANCET

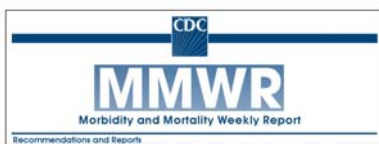
Volume 369 Issue 9562 24 February 2007

**Male Circumcision for HIV Prevention in Young Men in Kisumu, Kenya: a Randomised Controlled Trial**  
RC Bailey et al.

**Male Circumcision for HIV Prevention in Men in Rakai, Uganda: a Randomised Trial**  
RH Gray et al.

Reduction in relative risk of HIV infection associated with male circumcision (intent-to-treat analysis):  
Kenya (n=2,784): 53%  
Uganda (n=4,996): 51%

### Integrating HIV Testing into Routine Medical Care



September 22, 2006

## Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings

### Embracing the Concept of Harm Reduction

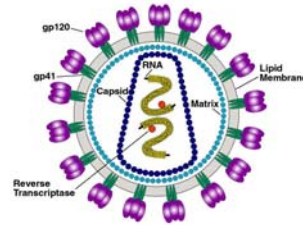
- We must take measures to lessen the consequences of high-risk behavior when eliminating the behavior altogether is not realistic, e.g.
  - Needle and syringe exchanges for IDUs
  - Condom provision to prostitutes, prisoners

## A Safe and Effective HIV Vaccine

- Critical to the effective control of HIV globally.
- The most important and difficult scientific challenge in AIDS research.



## HIV is Different



- The natural immune response to HIV is inadequate
- HIV hides from the immune system
- HIV targets and destroys the immune system
- HIV mutates rapidly

**JAMA**  
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

July 1996

### **AIDS in 1996: Much Accomplished, Much to Do**

A.S. Fauci



### **Twenty-five Years of HIV/AIDS**

Anthony S. Fauci

*"History will judge us as a global society by how well we address the next 25 years of HIV/AIDS as much as by what we have done in the first 25 years."*