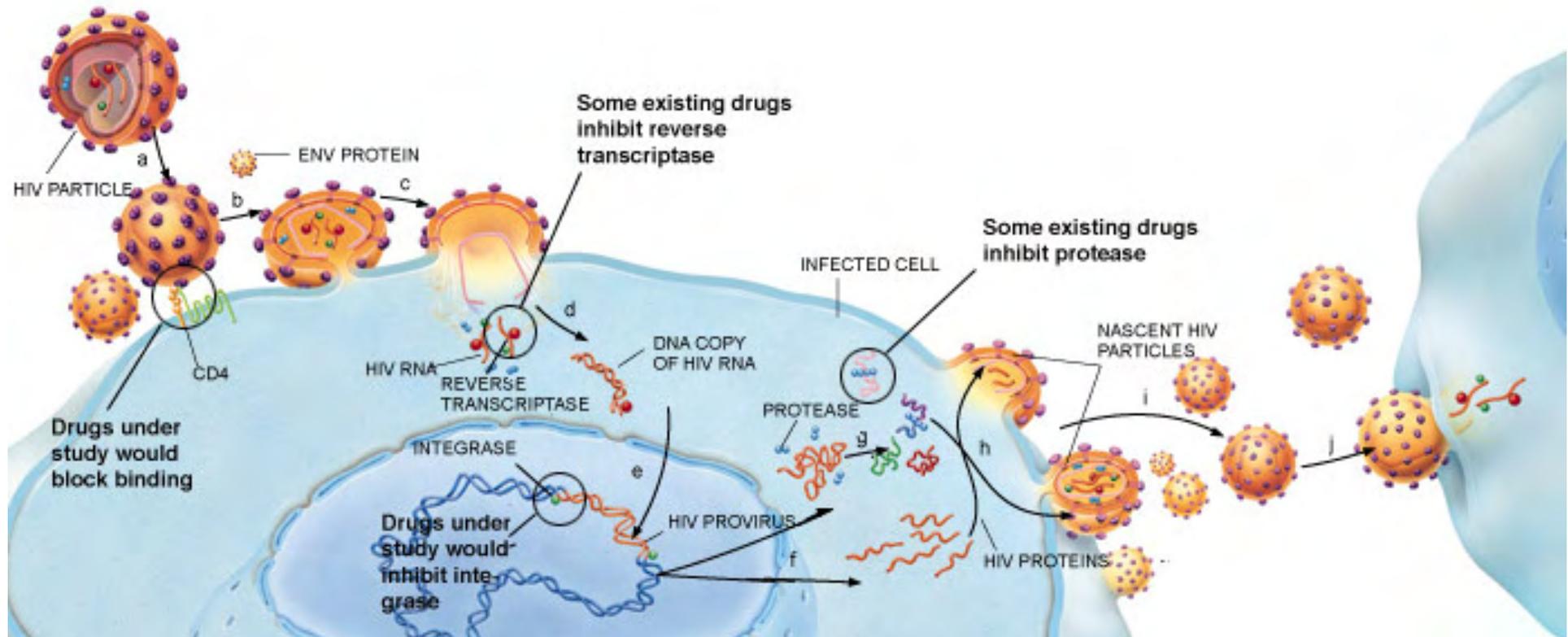


Facts About HIV/AIDS

Dr. Cherif Soliman
FHI/IMPACT



The Disease Without a Face

HIV/AIDS is a disease which affects other people - not people like you and me.

True or False?

Short History of HIV

- In 1982, HIV ONLY affected **MSM**
- then ONLY MSM **and haemophiliacs**
- then ONLY MSM, haemophiliacs **and Africans**
- then ONLY MSM, haemophiliacs, Africans **and injecting drug users**
- then ONLY MSM, haemophiliacs, Africans, injecting drug users **and promiscuous heterosexual Europeans**
- then ONLY.....

HIV/AIDS Global Estimates for Adults and Children (End 2005)

- People living with HIV/AIDS 40.3 million
- New HIV infections in 2005 4.9 million
- Deaths due to HIV/AIDS in 2005 3.1 million

Adults and Children Estimated to Be Living With HIV/AIDS (End 2005)



Total: 40.3 million

Estimated Number of Adults and Children Newly Infected With HIV (End 2005)



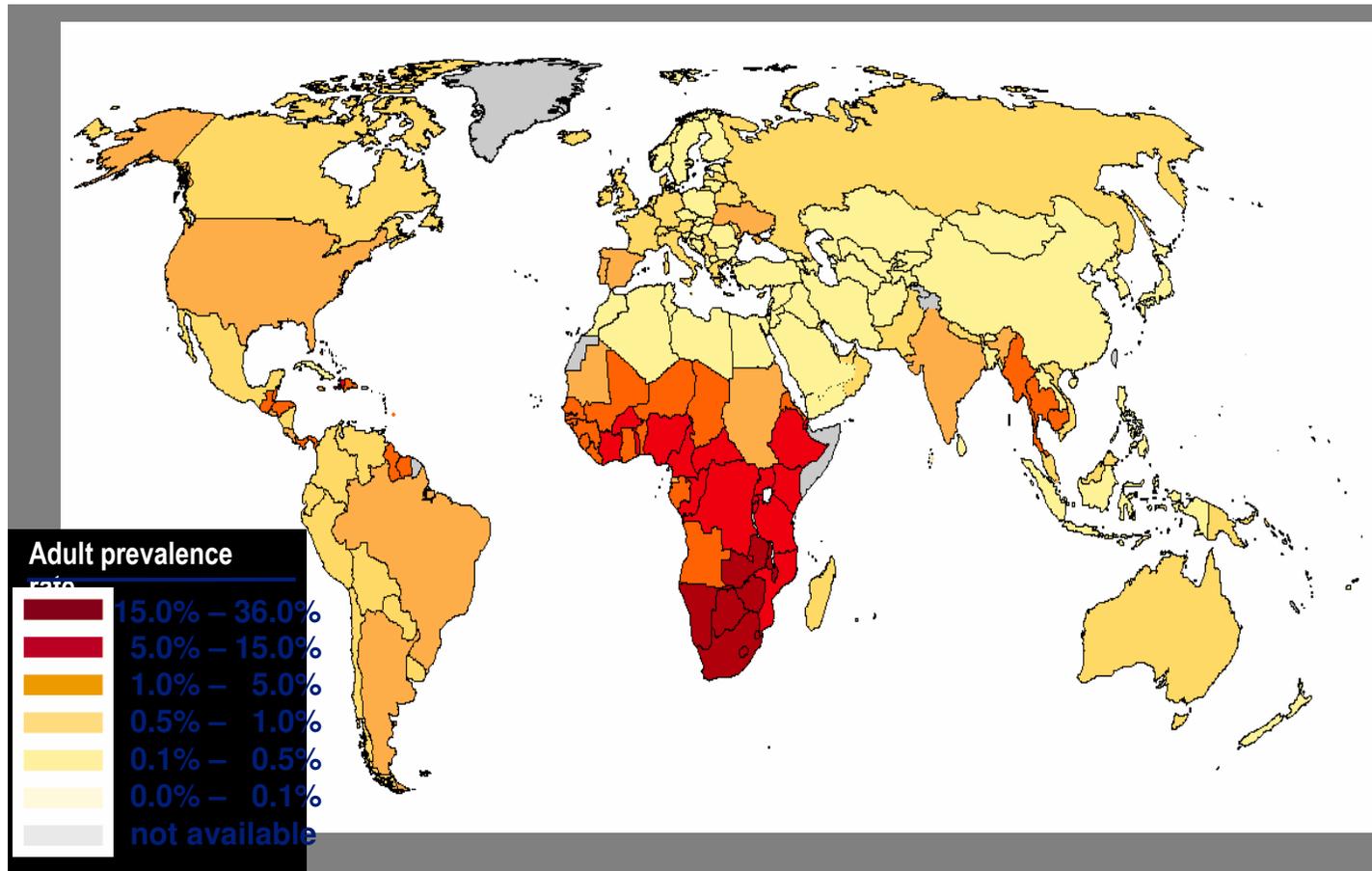
Total: 4.9 million

Estimated Adult and Child Deaths From HIV/AIDS (End 2005)

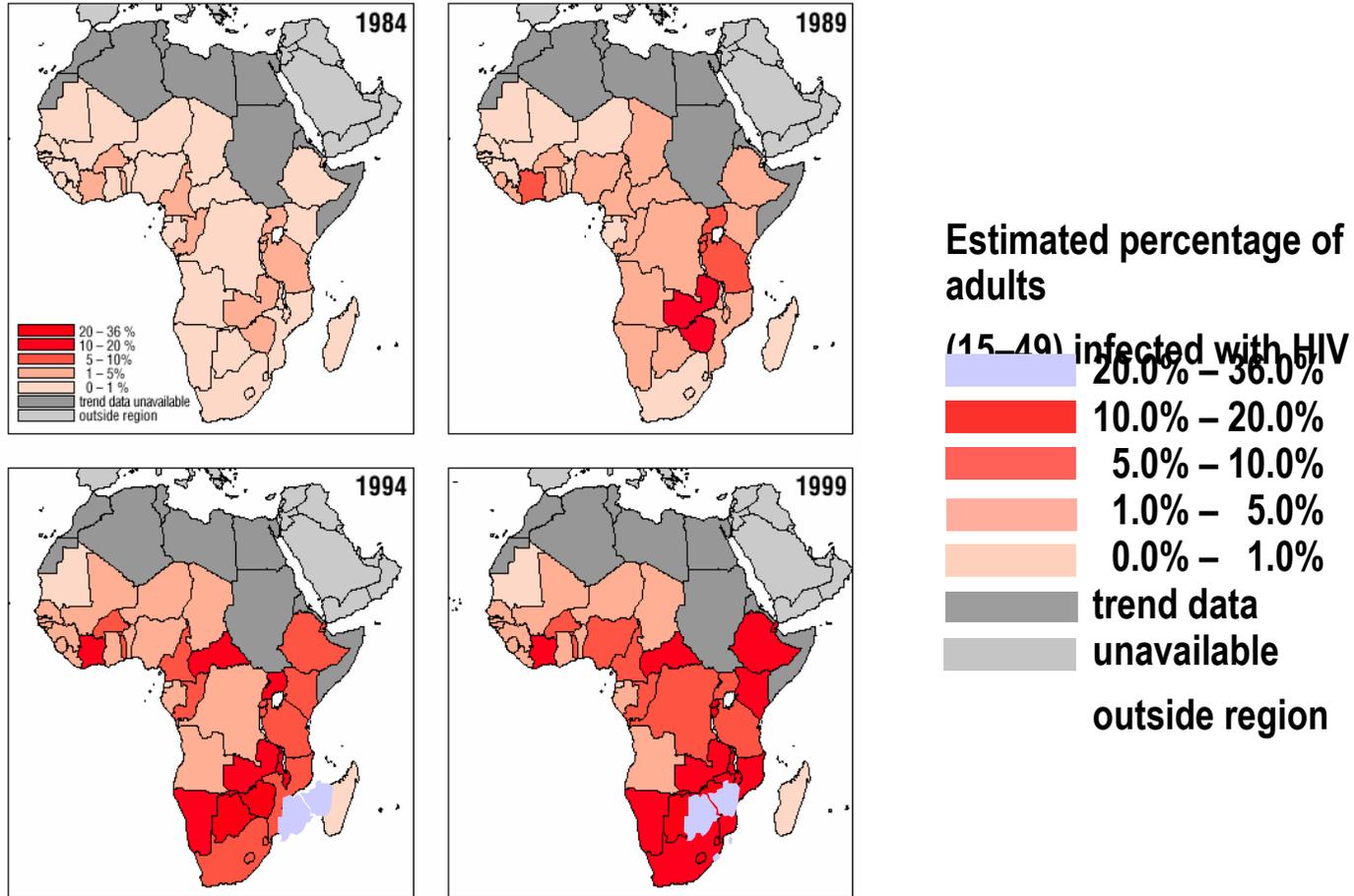


Total: 3.1 million

A Global View of HIV Infection



Spread of HIV Over Time in Sub-saharan Africa, 1984 to 1999



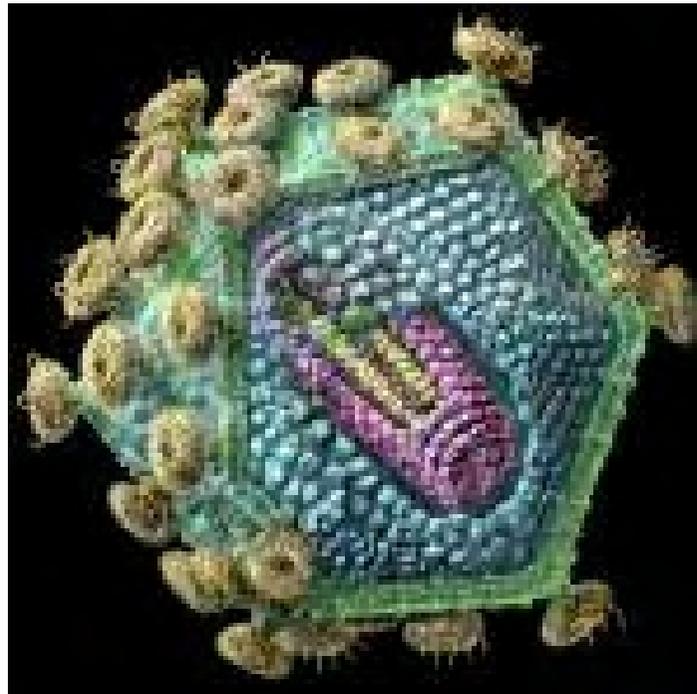
Virology



Robert Gallo



Luc Montagnier

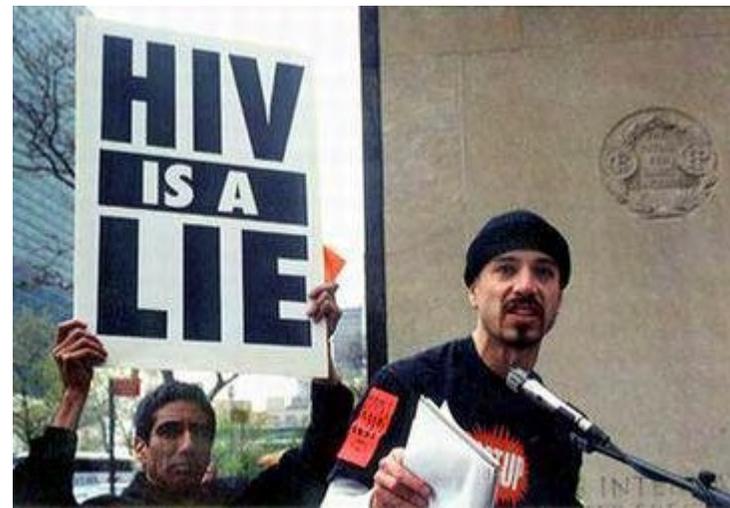


HIV-1 and HIV-2 Infections

- Similar diseases associated with both HIV-1 and HIV-2
- Progression from HIV to AIDS is faster in HIV-1 compared to HIV-2
- HIV-2 infected children have far better survival rates

MYTH: *AIDS is not Caused by HIV*

- In 1987, Dr. Peter Duesberg, attracted media attention by claiming that HIV does not cause AIDS.
- The link between HIV and AIDS has recently been questioned by President Mbeki and other political leaders in South Africa.



The Evidence that HIV **DOES** Cause AIDS...

- HIV and AIDS are invariably linked in time, place, and population group.
- Before the appearance of HIV, AIDS-related diseases were rare; today, they are common in HIV-positive individuals.
- HIV can be detected in virtually everyone with AIDS.

MYTH: *HIV was created*

- A number of conspiracy theories regarding the origins of HIV have been put forth, including that:
 - HIV was made by certain intelligence agencies
 - HIV was made by pharmaceutical companies
 - HIV originated from US bio-warfare program
- None of these theories are scientifically supported.

MYTH: AIDS Originated from Polio Vaccines

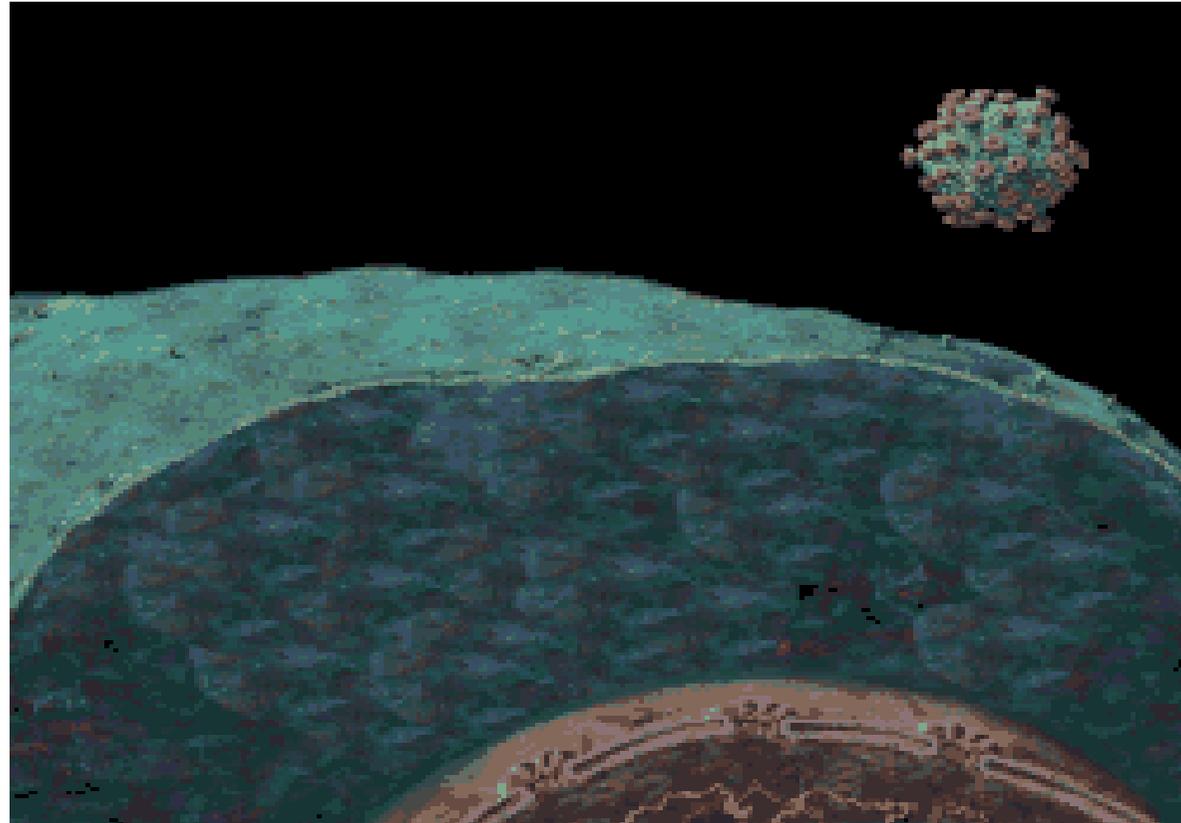
- Theory:
 - Some believe that oral polio vaccines (OPV) used in central Africa in the late 1950s were contaminated with SIVcpz.
- Counter arguments:
 - No SIVcpz has been detected in remaining vaccine stocks.
 - HIV-1 is believed to have entered human populations in the early 1930s.

Science's Best Guess

- Researchers at the University of Alabama made a discovery that leads them to believe that the SIVcpz virus in chimpanzees is the “grandfather” of the human HIV-1 virus.
- The HIV-2 virus is believed to have originated as an SIV virus in the sooty mangabey monkey.



The HIV Life Cycle



1. Free virus →

2. Binding and fusion

3. Infection →

4. Reverse transcription

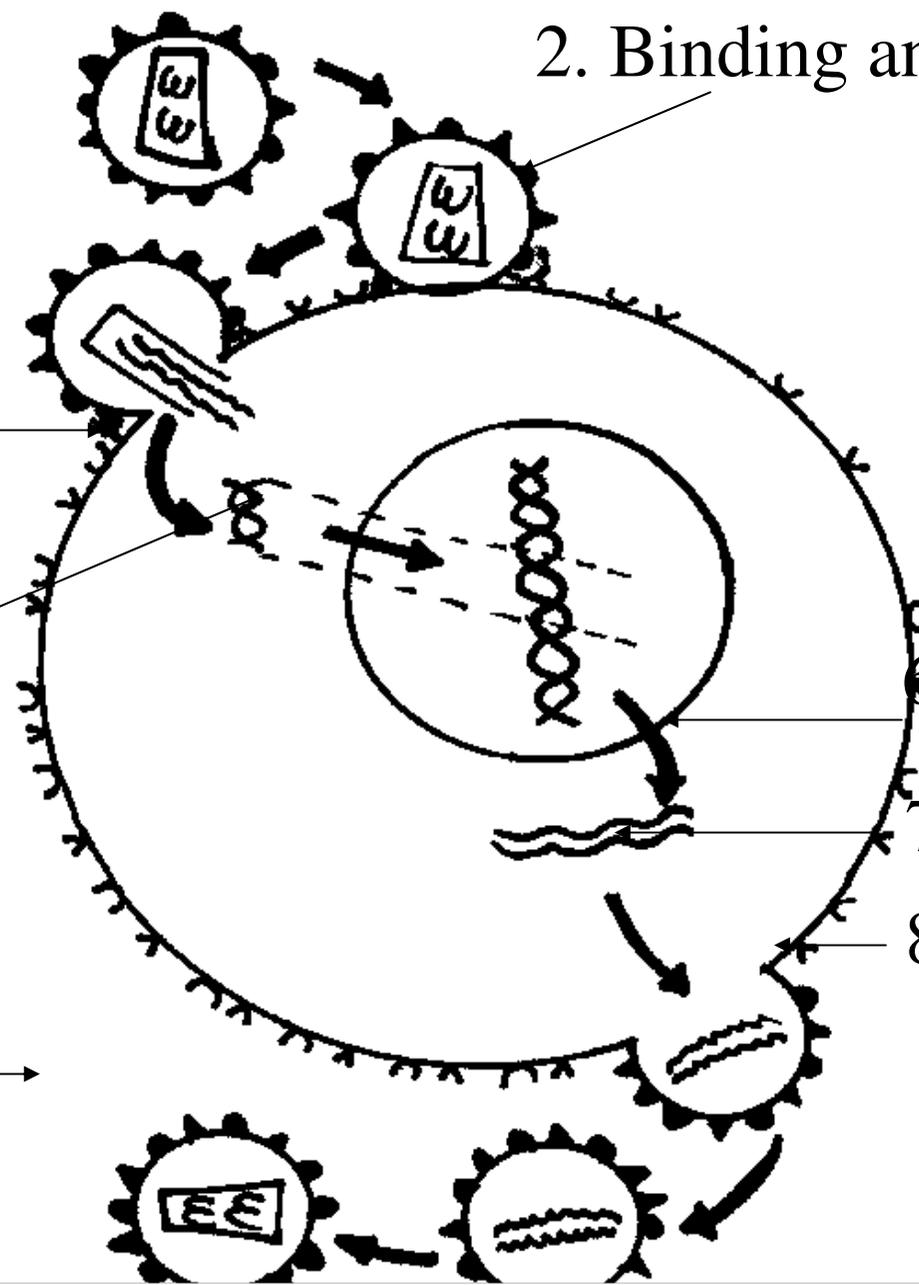
5. Integration

6. Transcription

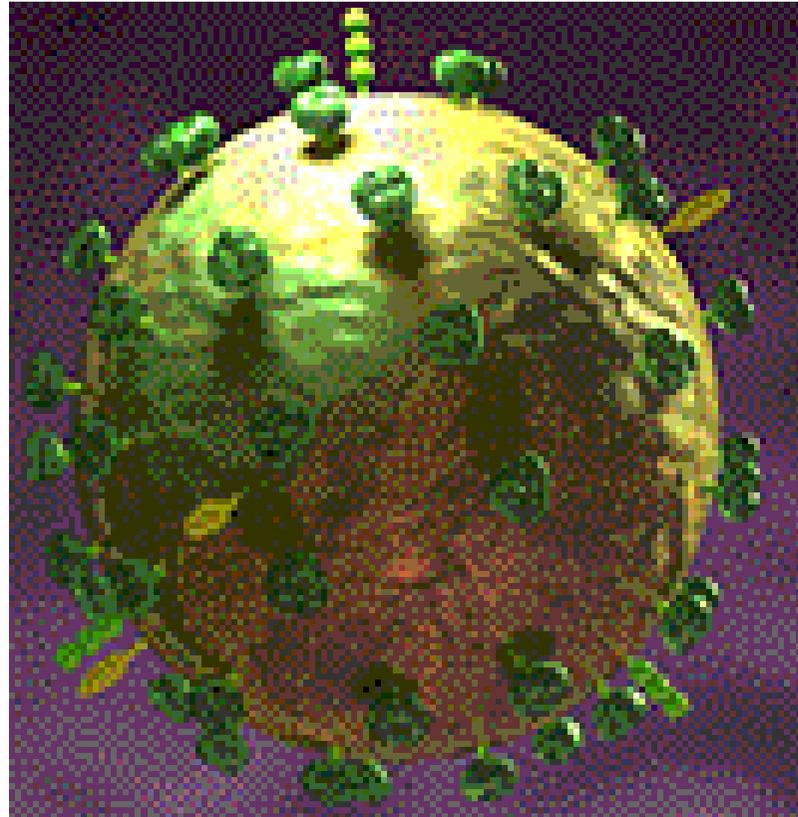
7. Assembly

8. Budding

9. Maturation →



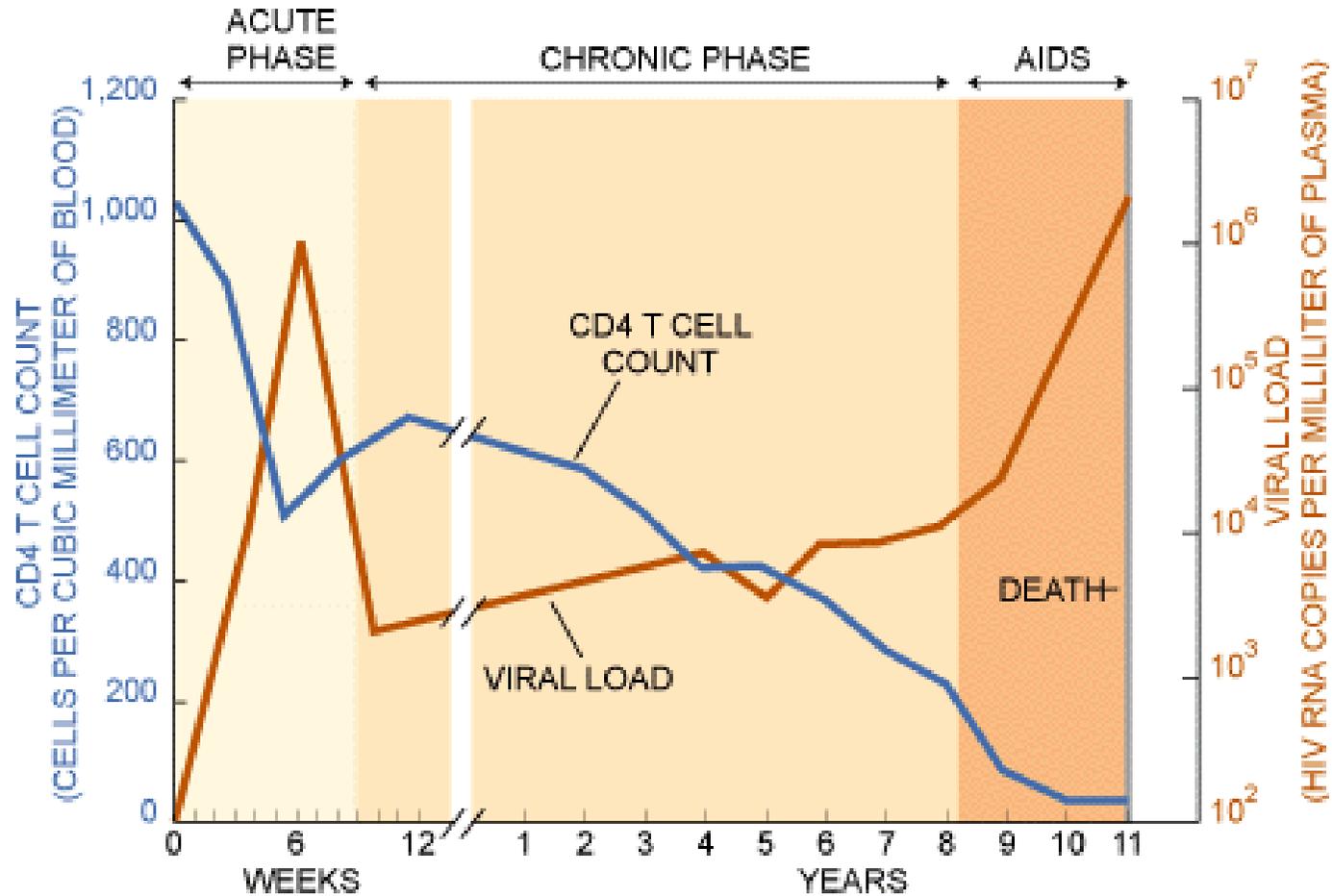
Virion Budding and Release



Cell Death

- The release of the new virus weakens the host cell and it dies
- This is how HIV weakens the immune system: it kills the helper T cells

Natural Course of HIV Infection



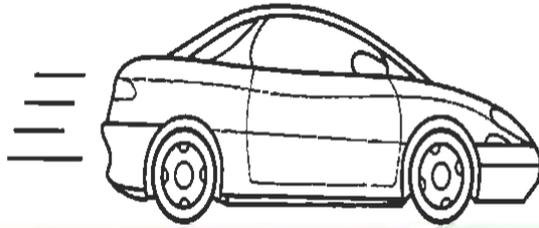
AIDS and HIV

- HIV infection occurs in 3 stages:
 - primary acute infection
 - prolonged period without obvious symptoms (*might continue for more than 10 years*)
 - AIDS characterized by opportunistic diseases leading eventually to death
- After HIV infection (without ARV):
 - Most will develop AIDS 8-10 years later
 - 5-10% will develop AIDS first few years
 - 5-10% will not progress to AIDS for 15 or more years

HIV DISEASE PROGRESSION

Car = patient with HIV

Speed = viral load



Distance = CD4 count

AIDS-related
illness

Clinical Features of HIV Infection

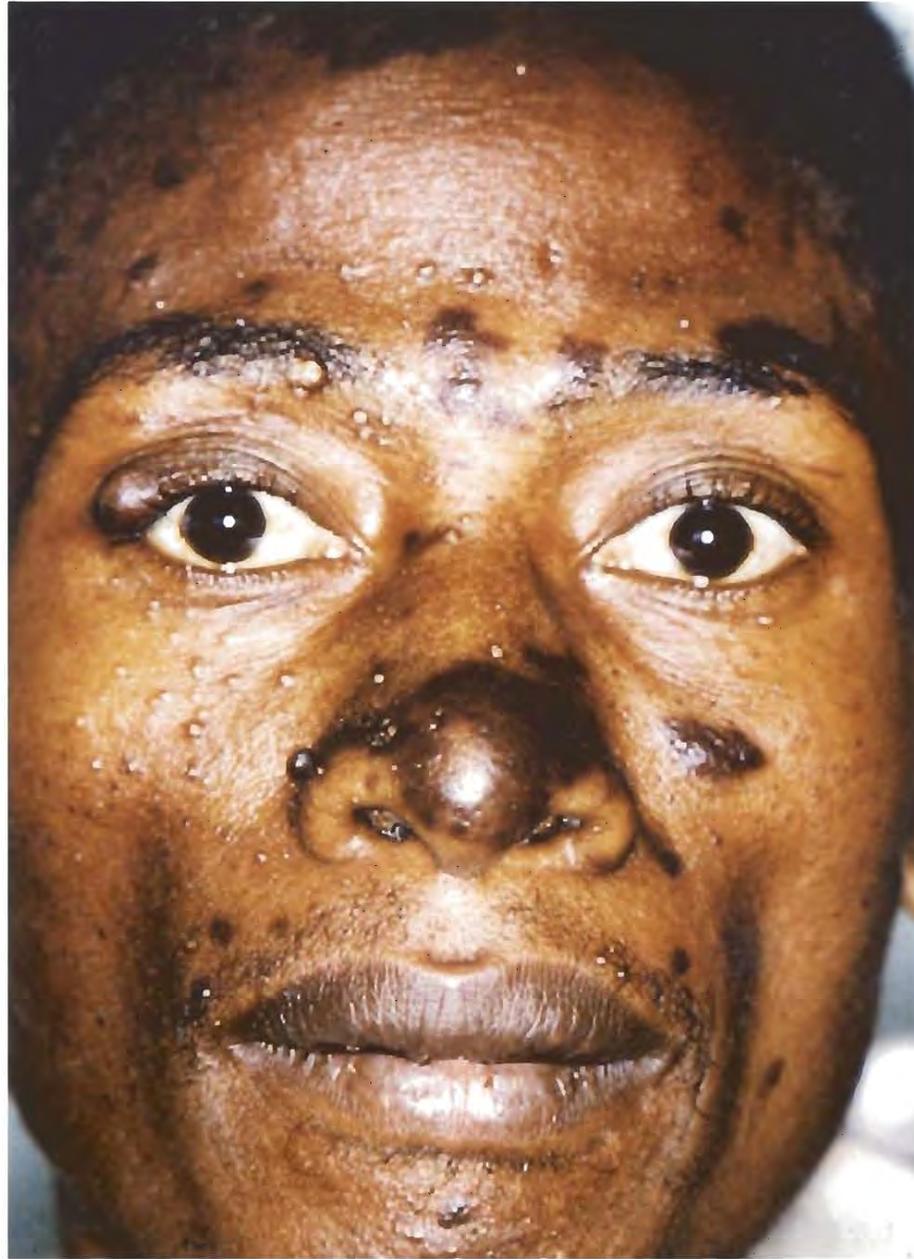
- Acute Primary Infection Syndrome
 - Flu-like illness, with high levels of virus replication until the infection is brought under immune control
- Asymptomatic Infection
 - No outward sign of disease, although there is a slow decline in the CD4 count, and very active viral replication. This stage can persist for 10+ years
- Symptomatic HIV Infection and AIDS
 - The immune system ceases to function and disease progresses, resulting in death

Clinical Picture of an HIV Infected Person

- The infected person may remain asymptomatic for many years
- Deterioration of the immune system is usually slow and progressive
- When severe immune depression is reached the person develops “AIDS”, becoming susceptible to infections; persistent diarrhea, fever, TB and pneumonia







Acquired Immune Deficiency Syndrome (AIDS)

- HIV infection is the most common cause of AIDS
- Immune deficiency can also be caused by
 - rare inherited diseases
 - cancer chemotherapy
 - immunosuppressive therapy in transplant recipients.
- Opportunistic diseases are common in people with immune deficiency (parasites, fungi, bacteria and viruses)

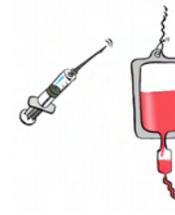
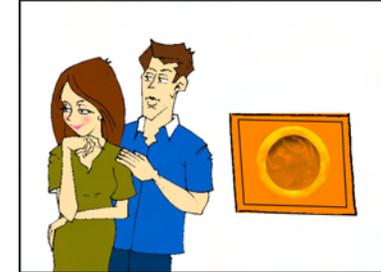
Infectious Body Fluids

Infectious body fluids include:

- Blood
- Semen
- Vaginal/Cervical Secretions
- Breast Milk

HIV Transmission

- Sexual transmission
- Blood-borne transmission
 - transfusion of infected blood and blood products
 - sharing of infected needles by intravenous drug users
- Mother to child transmission
 - during pregnancy, delivery or through breastfeeding



HIV is **NOT** Transmitted via

- Casual contact
 - such as shaking hands, hugging, touching, or kissing
 - Sharing eating and drinking utensils
 - Sharing toilets or swimming pools
- Tears, sweat and saliva
- Coughing and sneezing

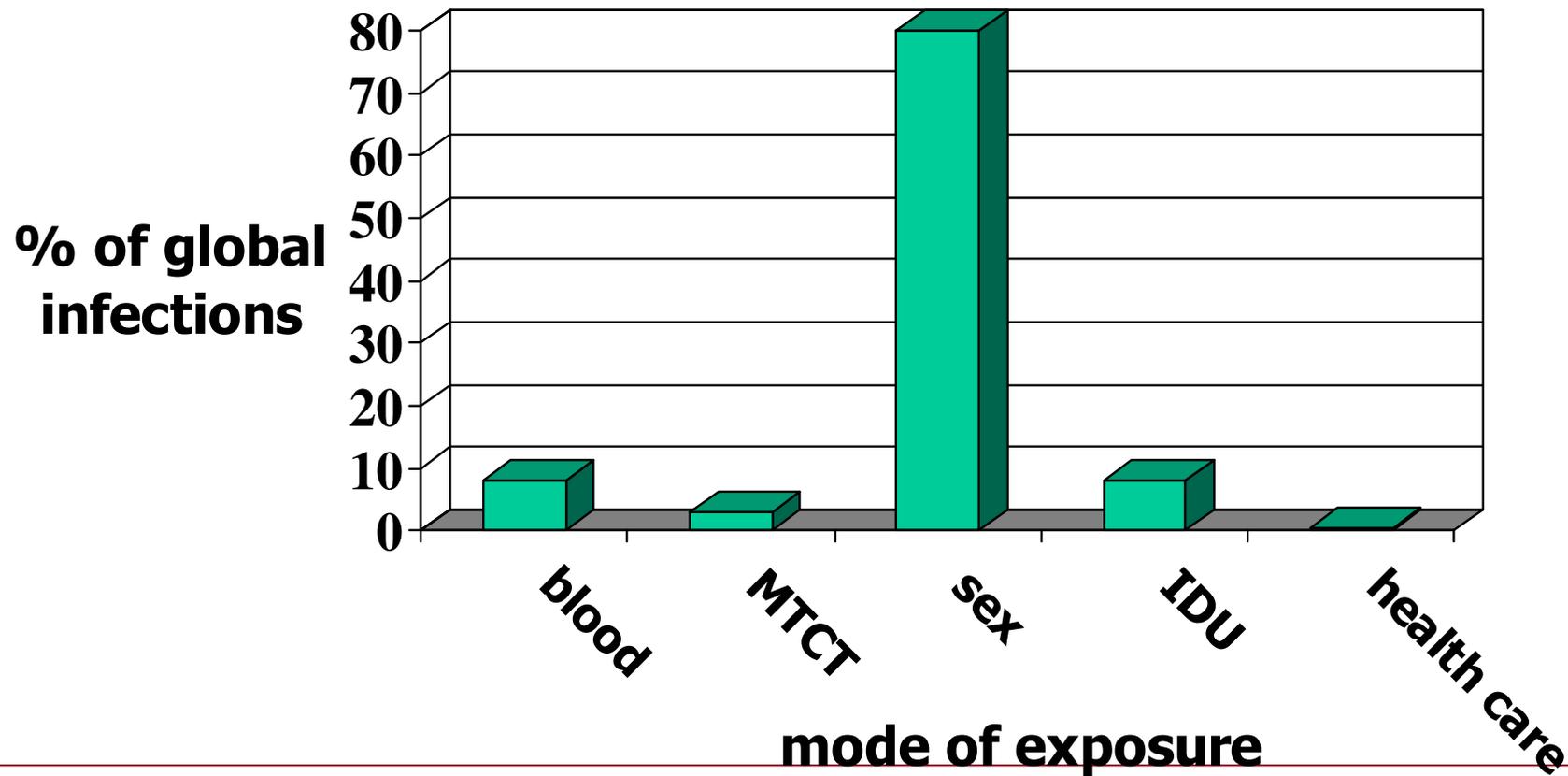


MYTH: *HIV is Transmitted by Mosquitoes*



- HIV is NOT transmitted by insects.
 - HIV does not reproduce or survive in insects
 - Mosquitoes digest HIV
 - Mosquitoes do not inject blood into their host, only saliva, and HIV cannot live in insect saliva

Contribution to Global Infections by Mode of Exposure



Just in case...

- HIV/AIDS does not survive well outside the body. If you come in contact with blood, or any other infectious fluids, the virus can be easily killed while it is outside the body.
 - ✓ *Heat*
 - ✓ *Hand soap*
 - ✓ *Hydrogen peroxide*
 - ✓ *Anything with 25% alcohol*
 - ✓ *Bleach*
 - ✓ *Lysol or any other disinfectant*

Universal precautions

- Hepatitis and HIV.
- Individuals can become infected with these diseases if blood or body fluids containing blood from an infected person enters their body through :
 - skin via a cut, a needle stick;
 - skin that is chapped, scraped, or broken;
 - mucous membrane: eyes, nose, or mouth.

“Take precautions that protect your body from exposure to these substances, rather than concentrate on who may become or currently is infected”

Women at Risk

- Low status may limit ability to negotiate safer sex, obtain information and receive health care
- Vaginal surface is larger and more vulnerable to infection than penis
- STIs are often asymptomatic in women and go untreated

Ray Witlin / World Bank



Socio-economic Factors Facilitating Transmission of Infection

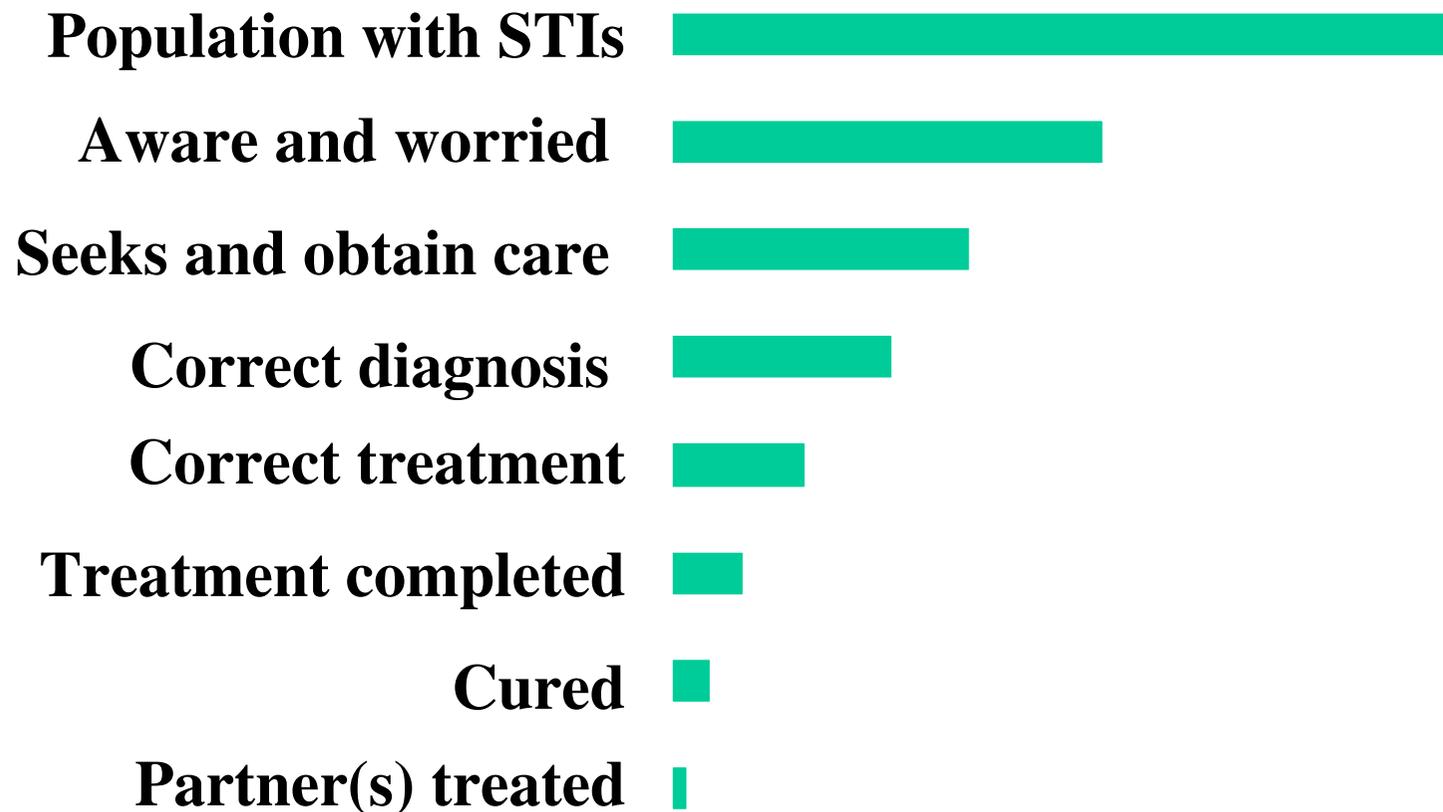
- Woman status
- Social mobility: migration, displacement, work
- Stigma and denial
- Political and social instability
- Cultural factors
- Poverty
- Drug abuse
- Tattoo, cupping, group circumcision

STIs Increase Risk of HIV Infection

- v Presence of other STIs increases the risk of HIV acquisition
- v In those already HIV-infected, presence of another STI facilitates HIV transmission

“Ulcerative STIs & non-ulcerative STIs increase the risk of infection 2-5 folds”

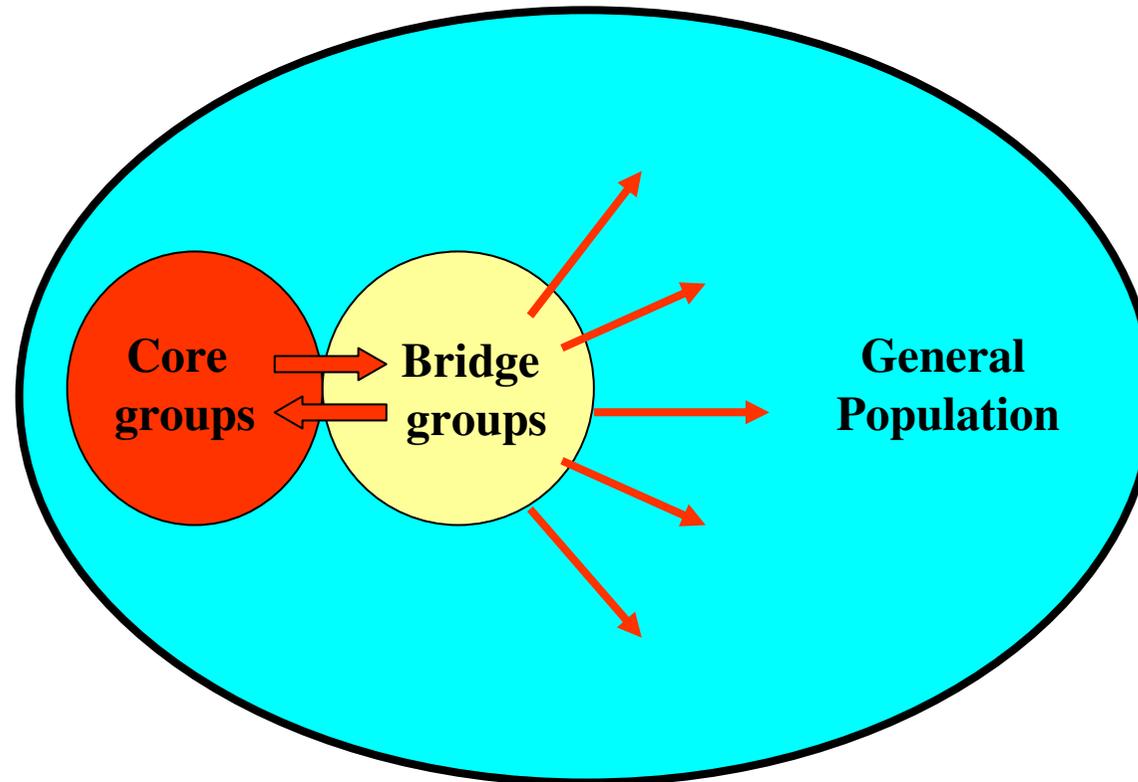
Population with STIs



STI Control and HIV Prevalence Among Sex Workers in Ivory Coast

- Without STI treatment 16.5%
- With basic treatment for STI 7.9%
- STI intensified treatment 5.5%

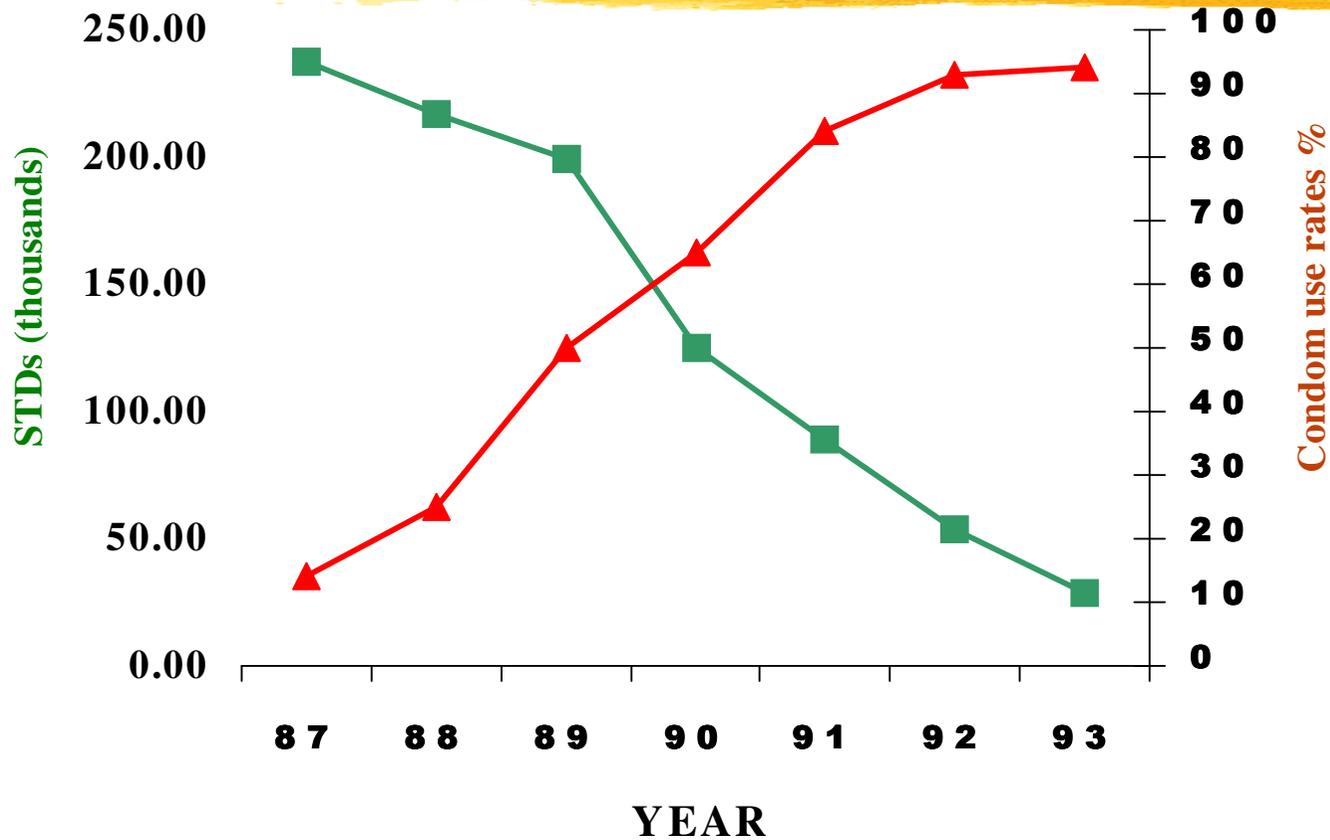
STI Transmission Dynamics at the Population Level



MYTH: *Condoms are not Effective Against HIV*

- Condoms are effective at protecting against HIV when used consistently and correctly.
- HIV cannot pass through intact latex condoms.

STDs and Condom Use Rates in Female Sex Workers in Thailand



Source: Hannenberg, R, et al Lancet 1994;344:243-5.

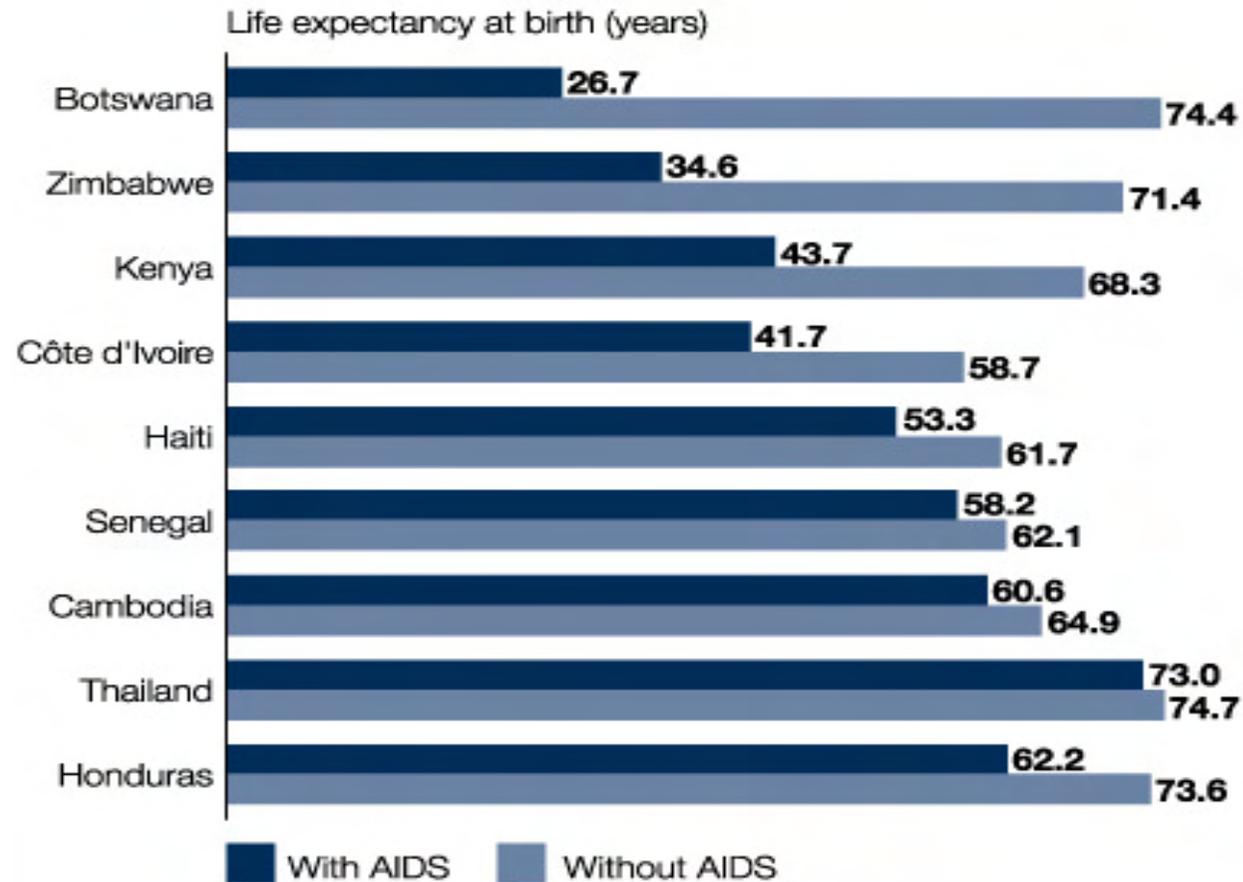
MYTH: *Only "high risk groups" are at risk for the disease.*

- **HIV/AIDS does not discriminate.** Many people feel that only "high risk groups" are at risk for the disease. That is simply not true. It is not who you are that puts you at risk, it's what you do.

Catch Bees with Honey - not Vinegar

- Be kind - it could be a member of your family
- Be gentle but truthful - it is the only way to build trust
- Only by identifying and helping those who are HIV positive will we prevent spread of HIV in the community

Effect of HIV/AIDS on Life Expectancy in 2010



Source: K. Stanecki, *The AIDS Pandemic in the 21st Century* (www.usaid.gov/pop_health/aids/Publications/docs/aidsdemoimpact.pdf, accessed July 12, 2002).



(UNICEF/05-110/06, ANDREW)

HIV Laboratory Diagnosis

- Infected individuals develop HIV antibodies within 1 to 3 months of infection
- Testing for HIV should be offered to all persons with behavioral risk factors
 - pre- and post-test counseling should be provided and informed consent obtained
- Serological diagnostic procedures include:
 - screening methods
 - confirmatory supplementary assays

HIV Management

- **Counseling**

- provides psychological support
- helps to evaluate personal risk
- facilitates preventive behavior
- guides to home based care

- **Clinical treatment**

- prophylaxis and treatment of opportunistic infections
- symptomatic treatment
- antiretroviral therapy



HIV Antiretroviral Therapy

Combination therapy is more effective in preventing viral resistance.

Antiretroviral therapy works through decreasing viral load, slowing progression to AIDS and improving survival time.

AIDS could be controlled but not cured similar to diabetes and hypertension

© : AVERT



"AZT"



© : AVERT

"Nucleoside Analogs"



© : AVERT

"Protease inhibitors"



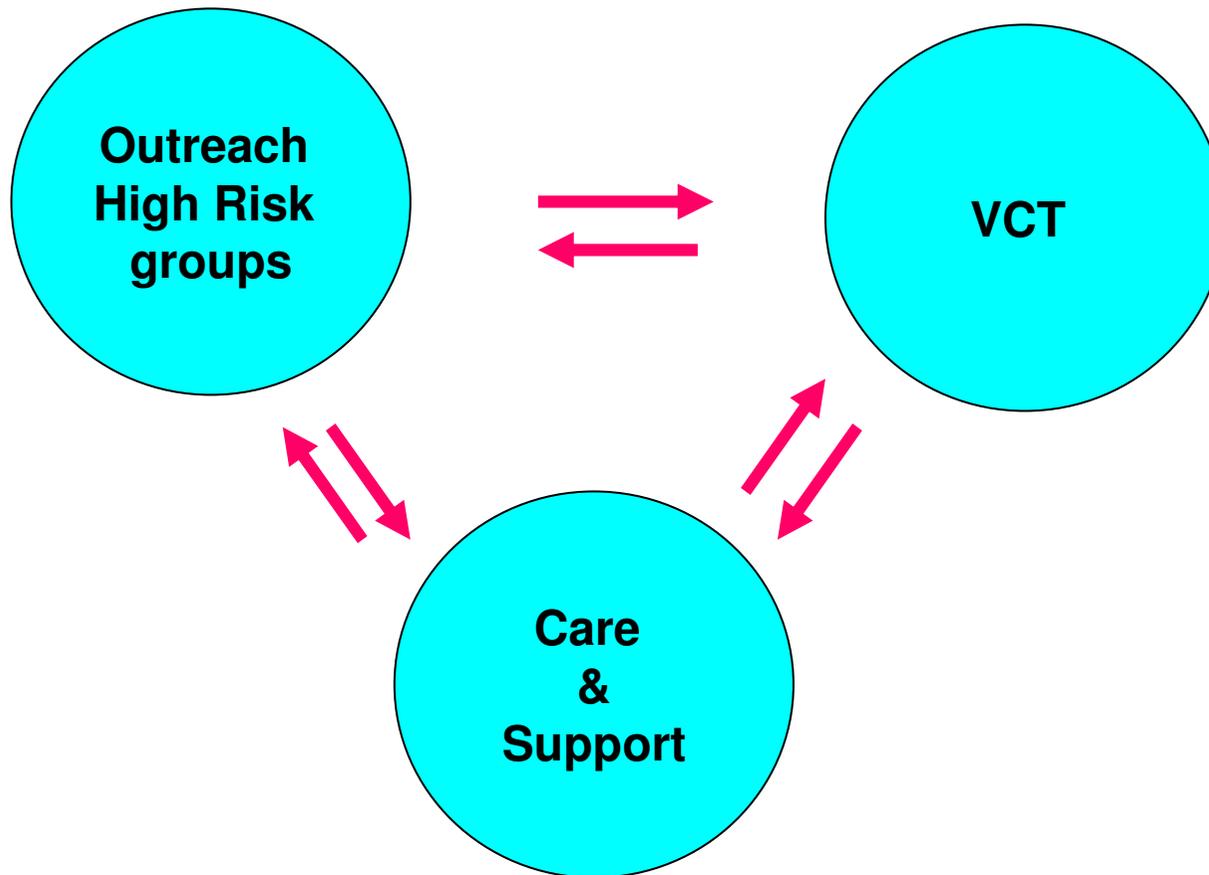
© : AVERT

"Non Nucleosides"

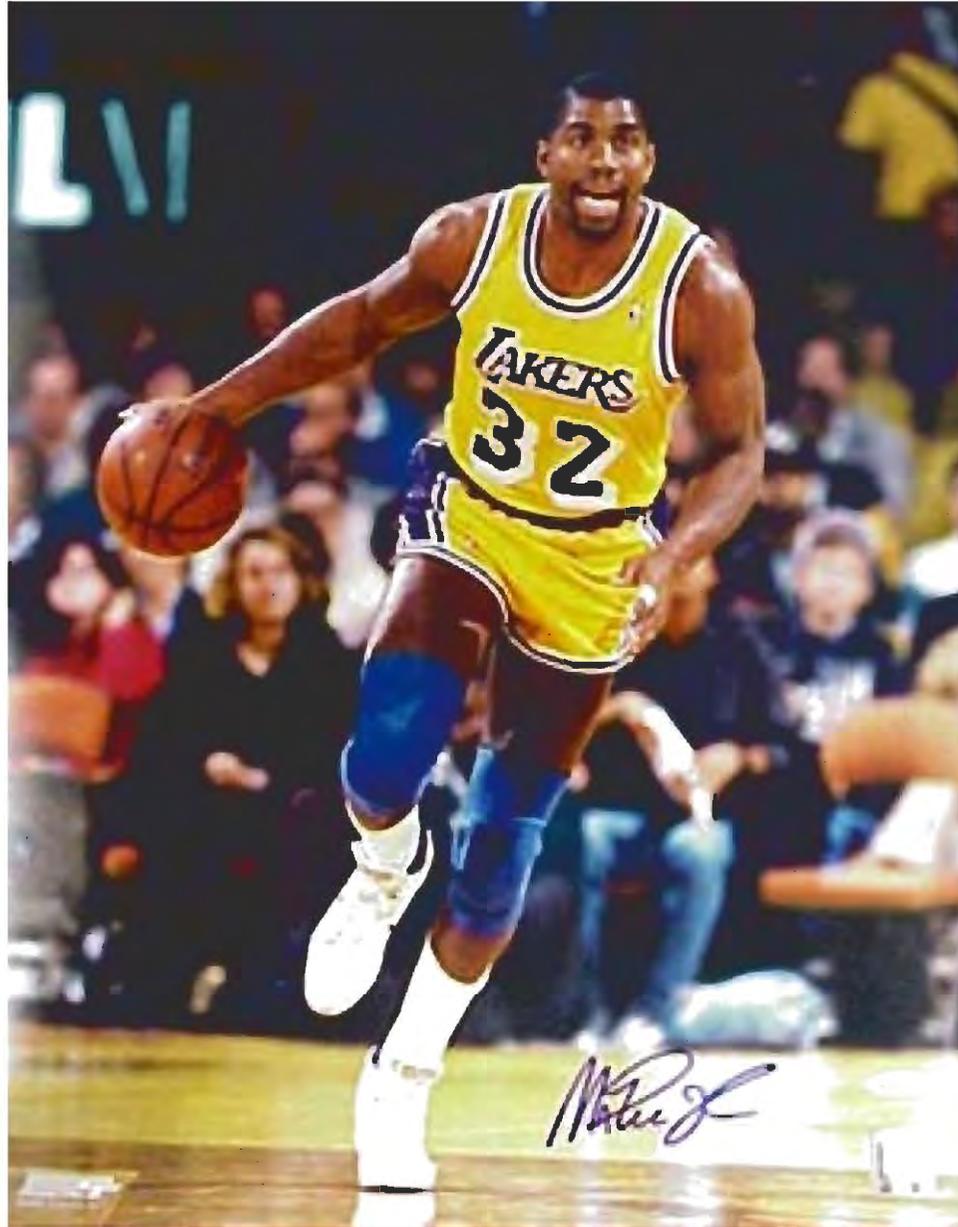
Most ARVs.....

- Expensive
- Lifelong
- Have side effects
- Interact with other drugs
- Have strict medication schedules or storage requirements

Prevention Strategies











“Red Ribbon”