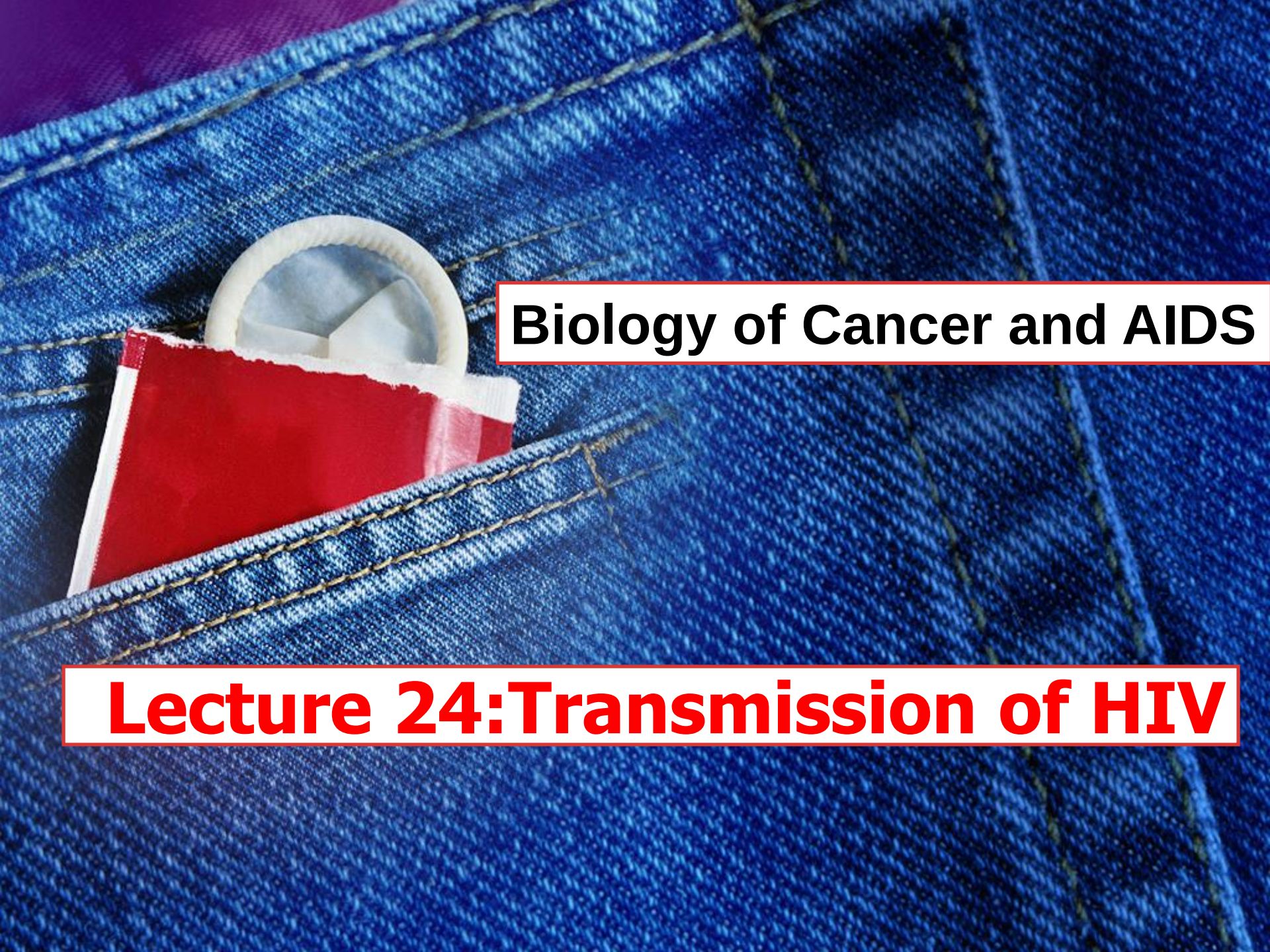


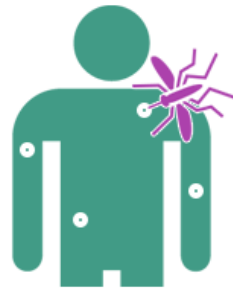
A close-up photograph of a blue denim pocket. A red condom is partially inserted into the pocket, with its white, ribbed tip visible. The denim fabric has a prominent texture and yellow stitching.

Biology of Cancer and AIDS

Lecture 24: Transmission of HIV

MYTHS ABOUT HIV AND AIDS

HIV IS **NOT** TRANSMITTED BY...



Insect bites



Toilet seats



Kissing



Sharing cutlery



Touching

YOU CAN GET HIV VIA...



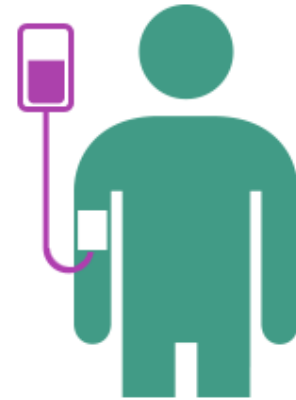
Sex without
a condom



Passed from
mother to baby



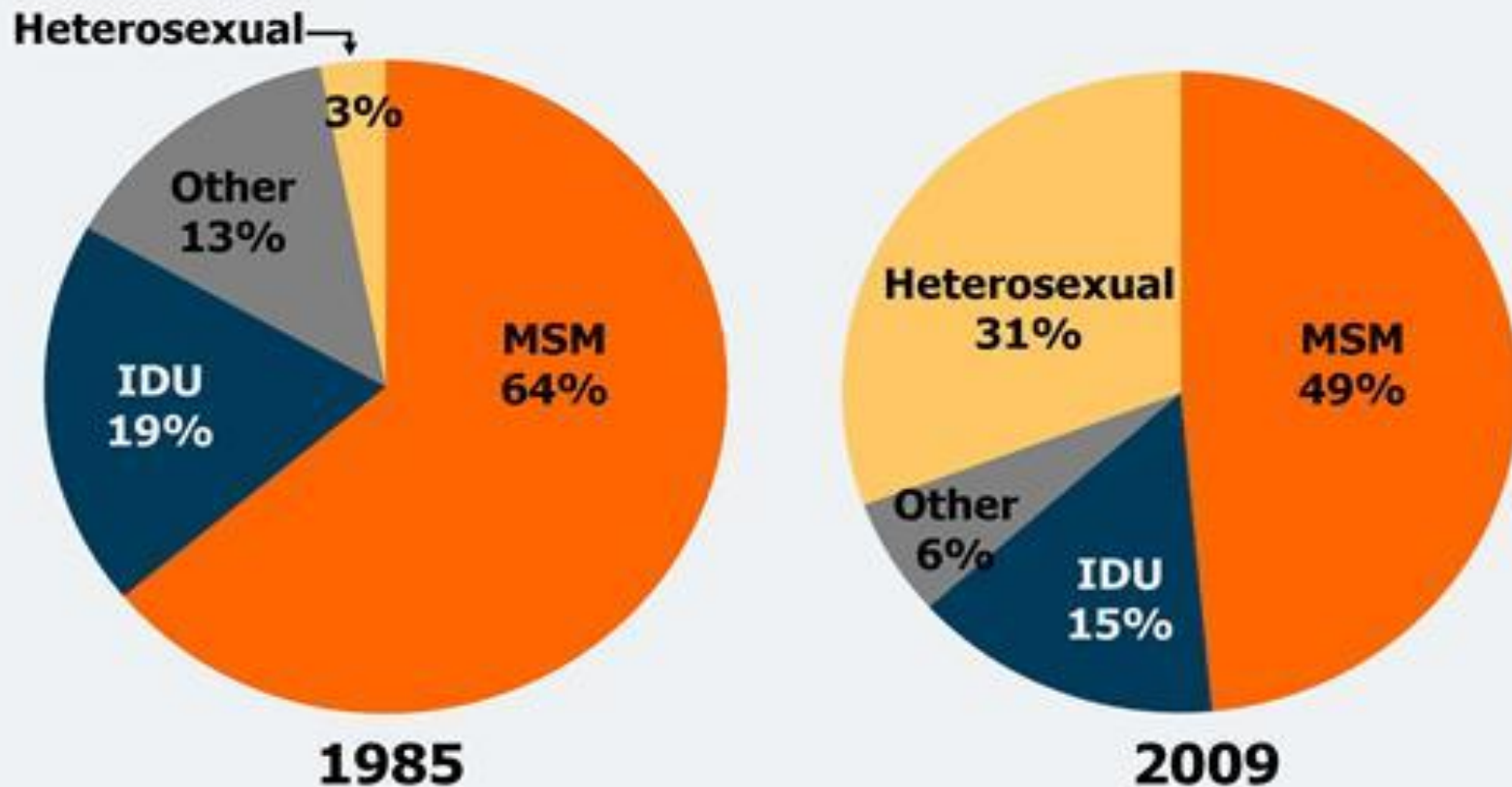
Sharing injecting
equipment



Contaminated blood
transfusions &
organ transplants

HIV Transmission Trends, United States

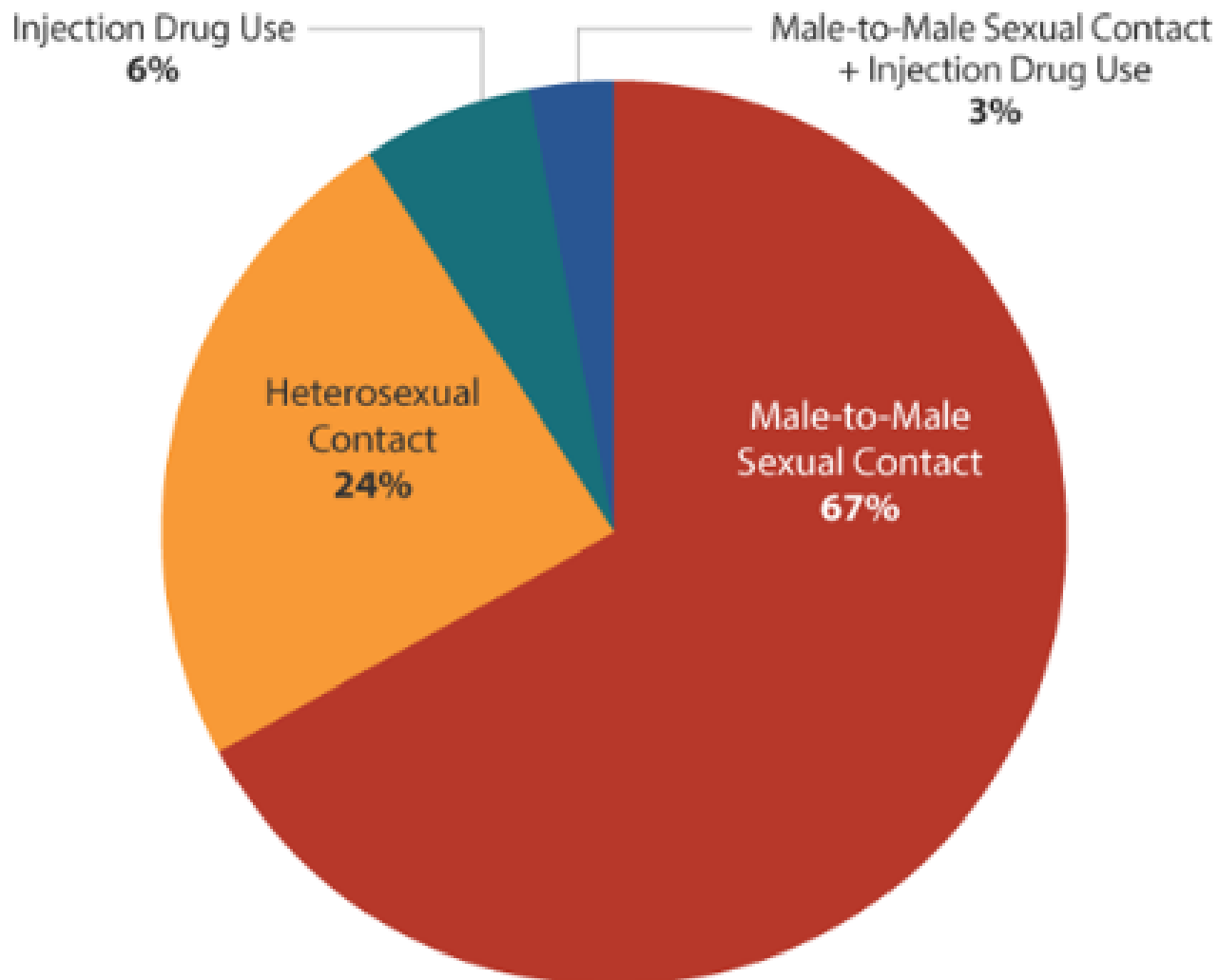
AIDS Diagnoses by Transmission Category, United States, 1985 & 2009



NOTE: Data are estimates. MSM=Men who have sex with men (gay and bisexual men); IDU=Injection drug use.

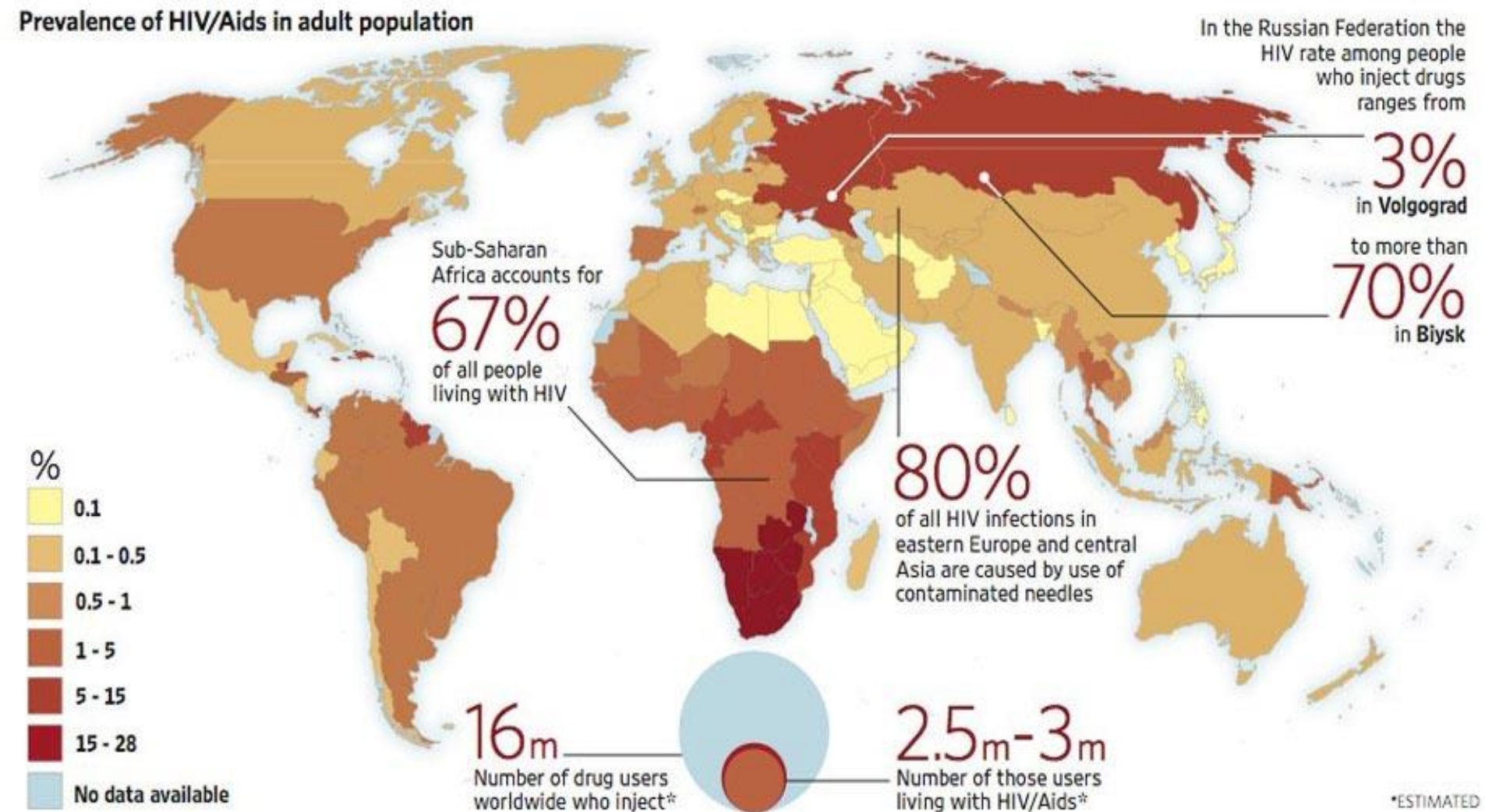
SOURCE: Kaiser Family Foundation, based on CDC, Presentation by Dr. Harold Jaffe, "HIV/AIDS in America Today", National HIV Prevention Conference, 2003; CDC, *HIV Surveillance Report*, Vol. 21, 2011.

New HIV Diagnoses by Transmission Category (2014, n=44,073)

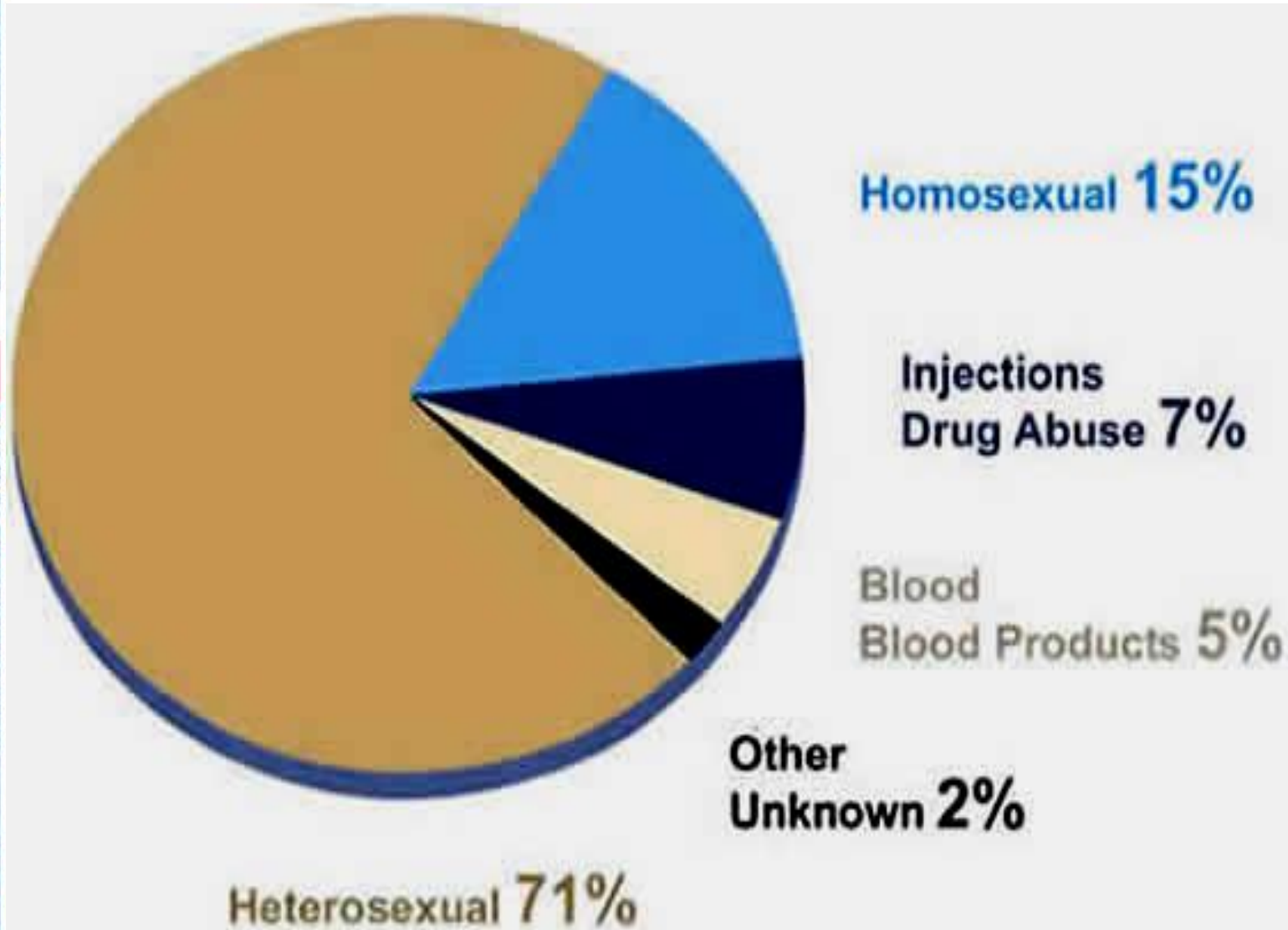


HIV Transmission in the World

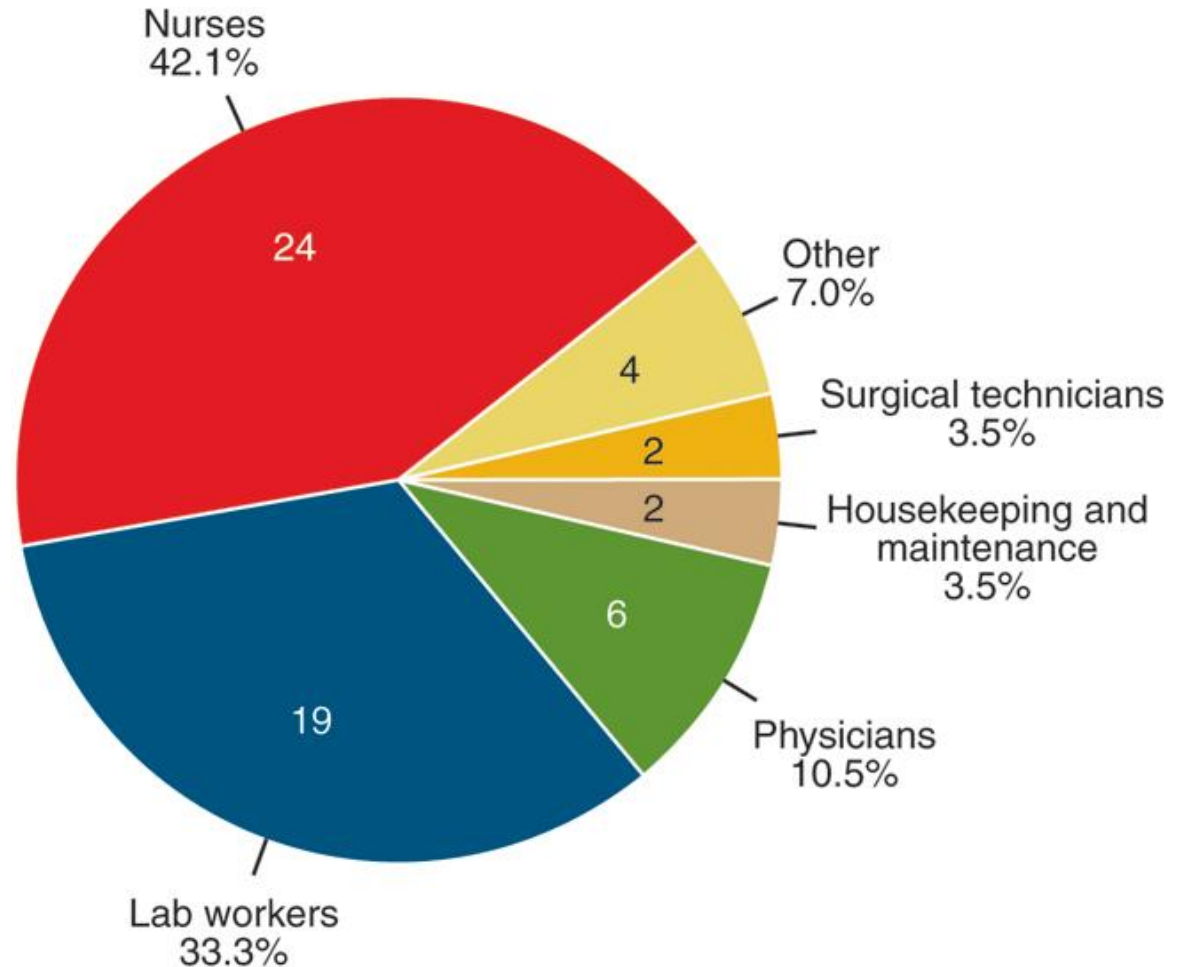
THE WORLDWIDE SCOURGE OF HIV/AIDS



Worldwide Modes of Transmission in Adults



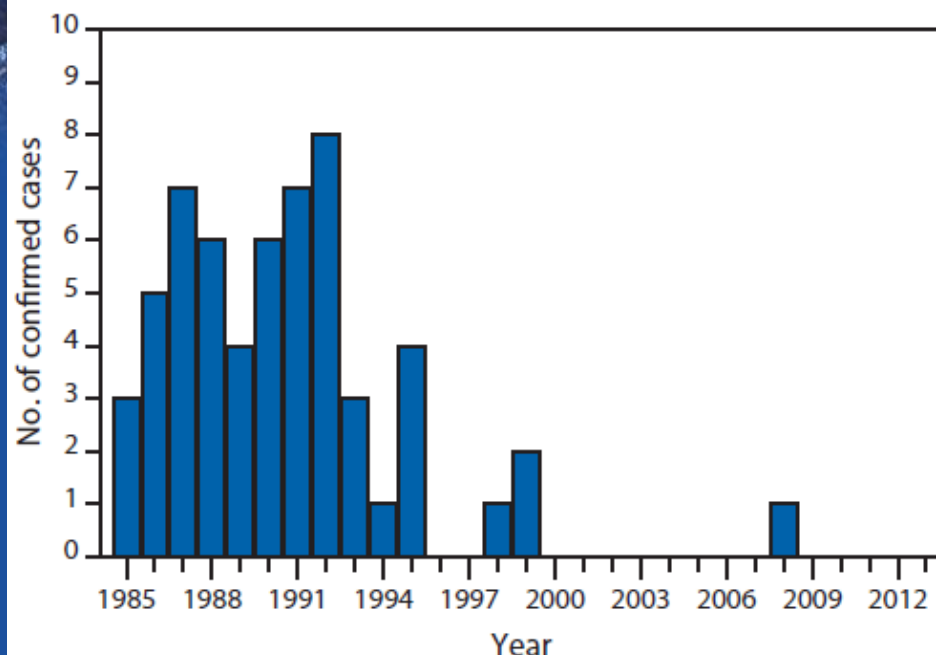
Distribution of Documented Cases of HIV Transmission Among Health Care Workers 1981–2002.



57 confirmed cases; 139 possible cases

No new documented cases of occupationally acquired HIV/AIDS have been reported in the US since December 2001.

FIGURE. Number of confirmed cases (N = 58) of occupationally acquired HIV infection among health care workers reported to CDC — United States, 1985–2013



Abbreviation: HIV = human immunodeficiency virus.

Source: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

Alternate Text: The figure above is a bar chart showing the number of confirmed cases (N = 58) of occupationally acquired HIV infection among health care workers in the United States reported to CDC during 1985–2013. During that time frame, 58 confirmed and 150 possible cases of occupationally acquired HIV infection among health care workers were reported.



POST-EXPOSURE PROPHYLAXIS (PEP)

TRANSLATE

TEXT SIZE

PRINT

P



PEP involves taking anti-HIV drugs as soon as possible after having been exposed.



You can get PEP from your doctor's office, emergency rooms, urgent care clinics, or a local HIV clinic.

E



To be effective, PEP must begin within 72 hours of exposure, before the virus has time to rapidly replicate in your body.



The medications have serious side effects that can make it difficult to finish the program.

P

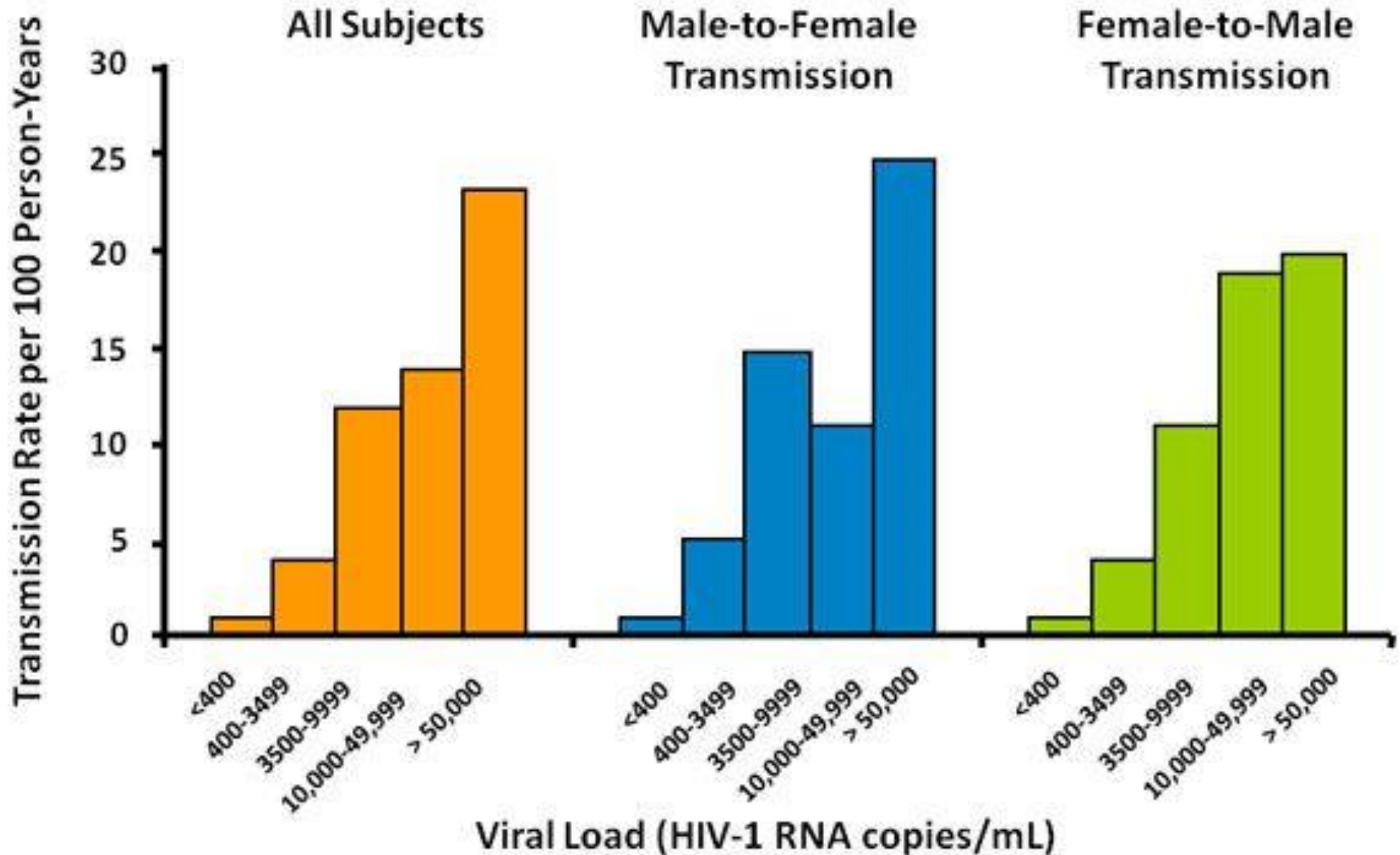


PEP consists of 2-3 antiretroviral medications taken for 28 days.

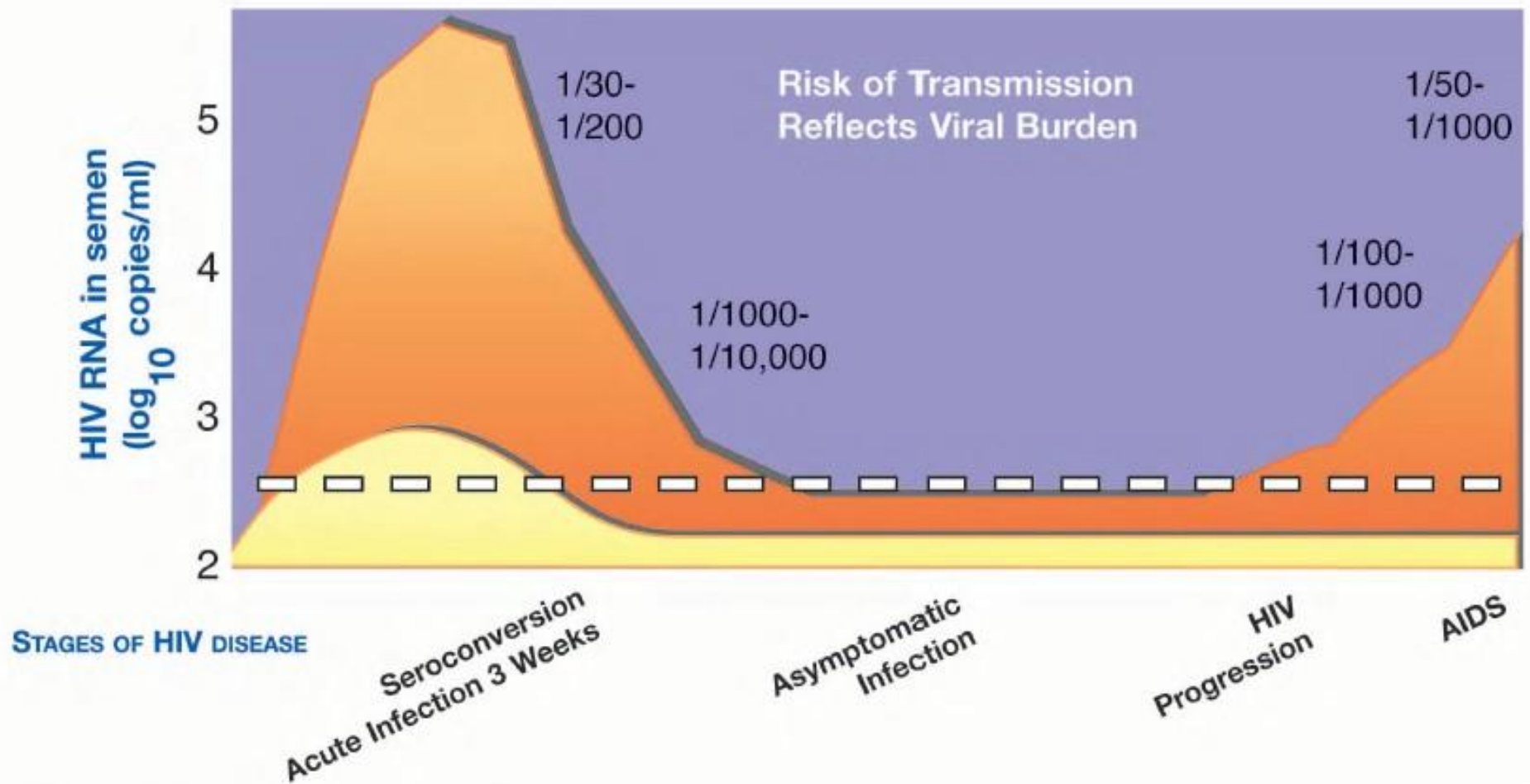


PEP is not 100% effective. It does not guarantee someone exposed to HIV will not become infected with HIV.

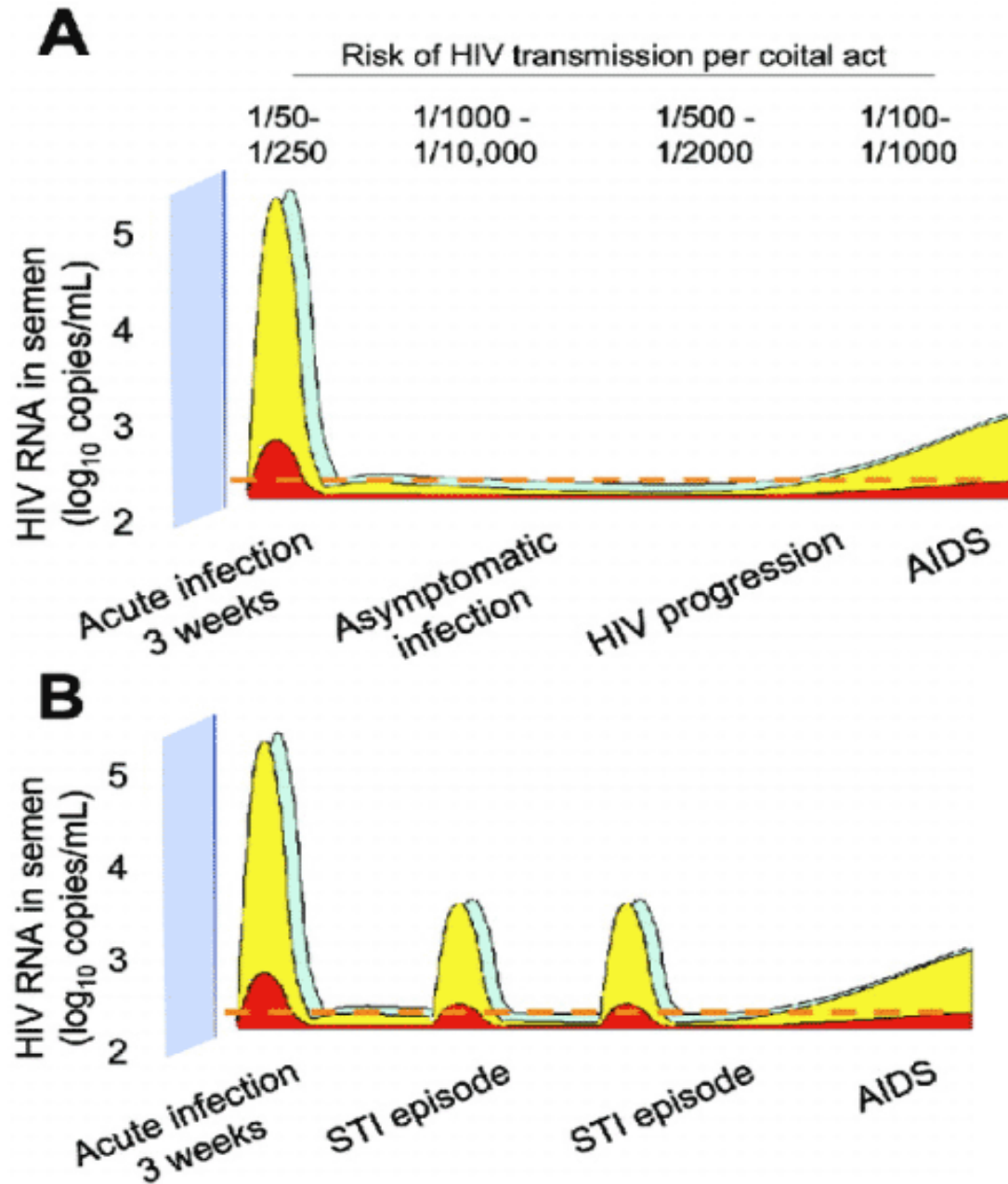
HIV-1 RNA Level Associated with Risk for Heterosexual HIV Transmission



Sexual Transmission of HIV

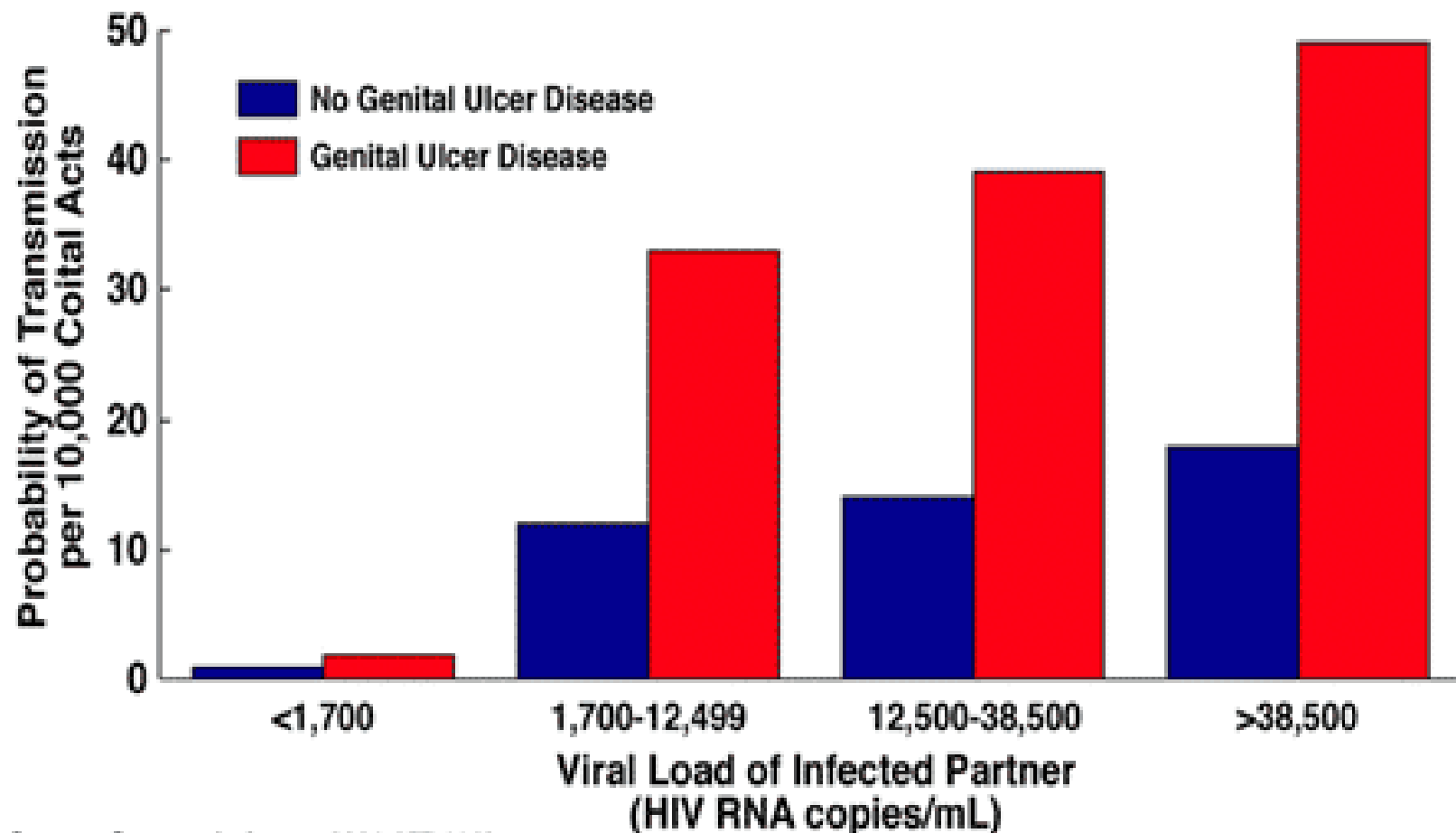


Risk of HIV Transmission & Stage of Disease



Effect of Viral Load and Genital Warts on HIV Transmission

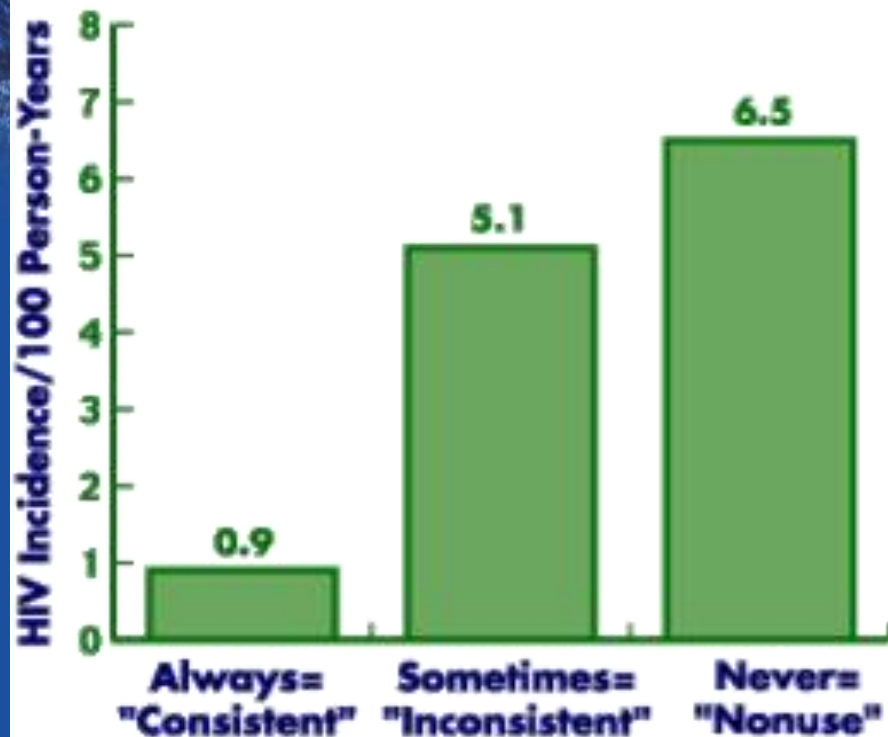
Probability of HIV Transmission per Coital Act in Monogamous, Heterosexual, HIV-Discordant Couples in Rakai, Uganda



Source: Gray et al., *Lancet* 2001;257:1149

Condom Use and HIV Transmission

Risk of HIV Transmission, by Consistency of Condom Use, Discordant Couples



Reproduced with the permission of The Alan Guttmacher Institute from: Davis KR and Weller S, The effectiveness of condoms in reducing heterosexual transmission of HIV, *Family Planning Perspectives*, 1999, 31(6):272-279.

Aside from abstinence, condoms are the most effective way to prevent HIV/AIDS or other STIs.

Male Condoms: Effectiveness for Pregnancy and HIV

Best case:

Pregnancy: 97%
HIV: 96%

Typical case:

Pregnancy: 86%
HIV: 87%

Sources: *Contraceptive Technology*. J. Trussell and K. Yost. Ardent Media, 1998. Reproduced with the permission of The Alan Guttmacher Institute from: Davis KR and Weller S, The effectiveness of condoms in reducing heterosexual transmission of HIV, *Family Planning Perspectives*, 1999, 31(6):272-279.



Routes of Exposure and Risk of HIV Transmission

INFECTION ROUTE	RISK OF INFECTION
SEXUAL TRANSMISSION	
Female-to-male transmission	1:700 to 1:3,000
Male-to-female transmission	1:200 to 1:2,000
Male-to-male transmission	1:10 to 1:1,600
Fellatio	0 to 6%
PARENTERAL TRANSMISSION	
Transfusion of infected blood	95:100
Needle sharing	1:150
Needle stick	1:200
Needle stick/ <u>AZT PEP</u>	1:10,000
TRANSMISSION FROM MOTHER TO INFANT	
Without AZT treatment	1:4
With AZT treatment	Less than 1:10
Adapted from Royce, Sena, Cates and Cohen, NEJM 336, 1072 (1997)	

Drug Use, Alcohol and HIV Infection



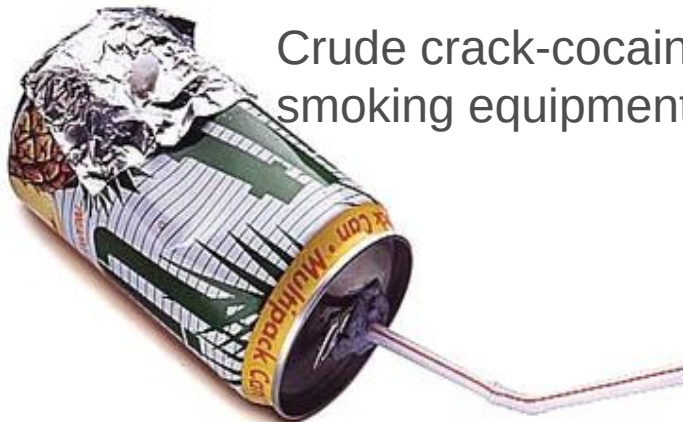
Injecting Drug Use



A pipe used to smoke 'crystal meth', seized by the U.S. DEA



The needle paraphernalia that is supplied in a 'needle exchange pack'.



Crude crack-cocaine smoking equipment

Alcohol use is associated with high-risk sexual behaviors and injection drug use, two major modes of HIV transmission.

“Nobody really pays attention to the fact that alcohol really has a higher odds ratio for being a risk factor for transmission of HIV” Dr. Kevin Fenton, CDC

Criminal, Deliberate and Reckless HIV Transmission

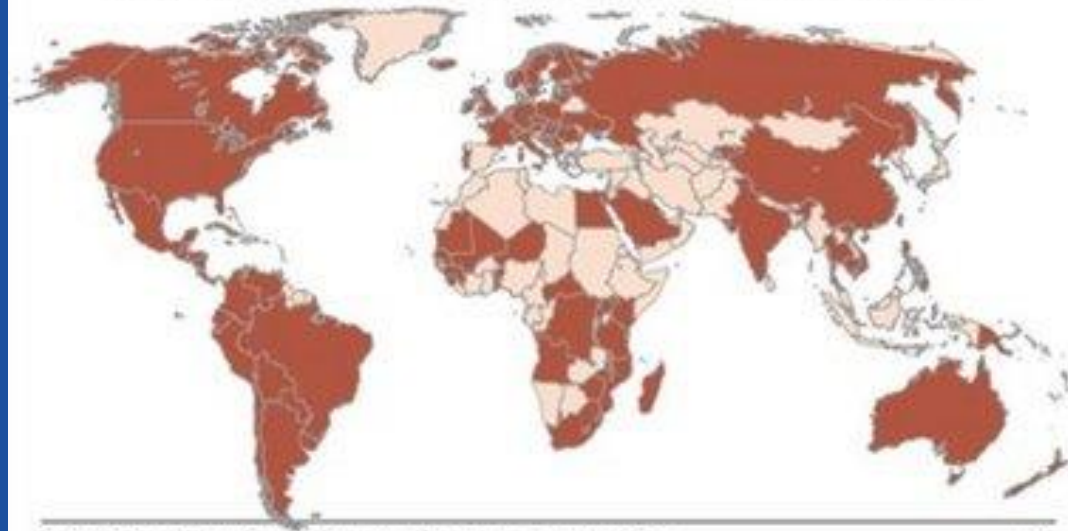


More countries have HIV laws

An increasing number of countries are applying criminal laws to prosecute HIV transmission or exposing it to another person, a new report found.

Countries with laws criminalizing the spread of HIV

■ Has laws or considering adopting laws that criminalize HIV transmission or exposure □ Law does not apply/ no info available



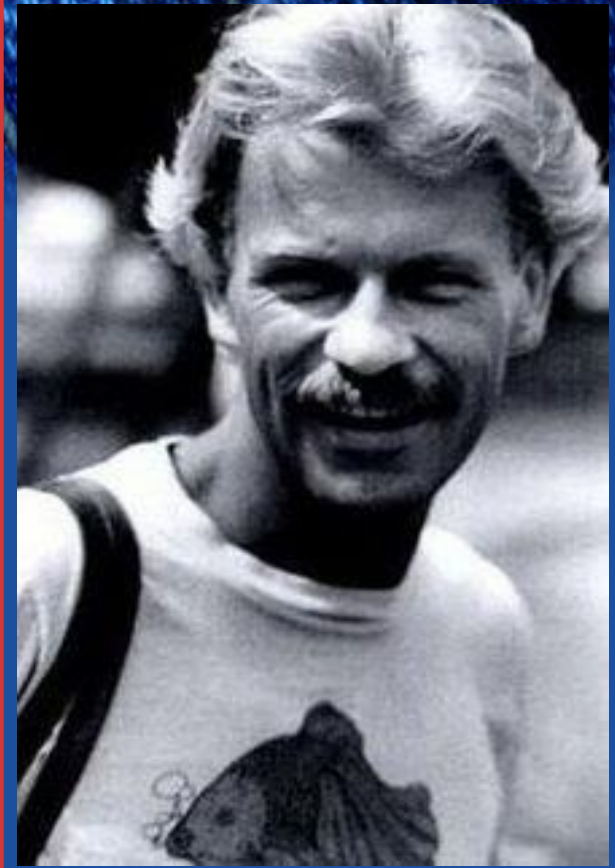
SOURCE: International Planned Parenthood Federation

AP

- (1) Intentional
- (2) Reckless
- (3) Accidental

“Patient Zero” and HIV Transmission

- ❑ **Gaëtan Dugas:** A Canadian who worked for Air Canada as a flight attendant
- ❑ Claimed to have had over 2,500 sexual partners across North America since 1972
- ❑ Diagnosed with Kaposi's Sarcoma in June 1980
- ❑ In 1982 the CDC linked him to 9 of the first 19 cases in Los Angeles, 22 cases in NYC and 9 more in 8 other cities – Total of 40 of the first 248 cases in the U.S.



Born	February 20, 1953
Died	March 30, 1984 (aged 31) Quebec City, Quebec
Occupation	Flight attendant

"Bug Chasing": the Shocking Quest to Become HIV-Positive

By Didier and Luis as told to Special Correspondent **Hernán Muñoz Ratto**, U.S.

07/25/06

Reader Rating ★★ ★



"Bug chasers" say they are fully aware of the consequences of attending "Conversion parties." Most of them just want to stop worrying about when they might become infected with HIV in the course of time.

“Some people choose to drop themselves from the Niagara Falls inside a barrel, others play Russian roulette. I chose to get HIV.”

Didier: I had to look for a while before I found a way to get HIV. Then, finally, I got the "opportunity" I was hoping for. I read in one of the chat rooms for gays I used to check out that there was going to be a "conversion party" on the weekend. I told them I wanted to go and, after a few e-mails back and forth, I was given the green light.

"Conversion" is a term invented in the 1990s for the fetish of a small minority of gay men wanting to become infected with HIV. Various gay Web sites have chat rooms devoted to "Bug Chasers," looking specifically to have unprotected sex with HIV-positive men. According to Didier, who tells this story, and others, there are "conversion parties" are where these like-minded people gather together to pursue their goal.

It is thought that some men wish to become infected with HIV because they feel guilty or left out because many of their friends are HIV-positive. Others have a fatalistic attitude about becoming HIV-positive and want to stop worrying about when they might become infected in the course of time.

I interviewed two habitués to conversion parties, Luis and Didier. Here they give the inside story to Orato.

Brothers on the "Down Low"

"Men Who Sleep with Men (MSM), and Then Go Home to their Women" -- The New AIDS Crisis

Story By: Tamala Edwards
Time Magazine

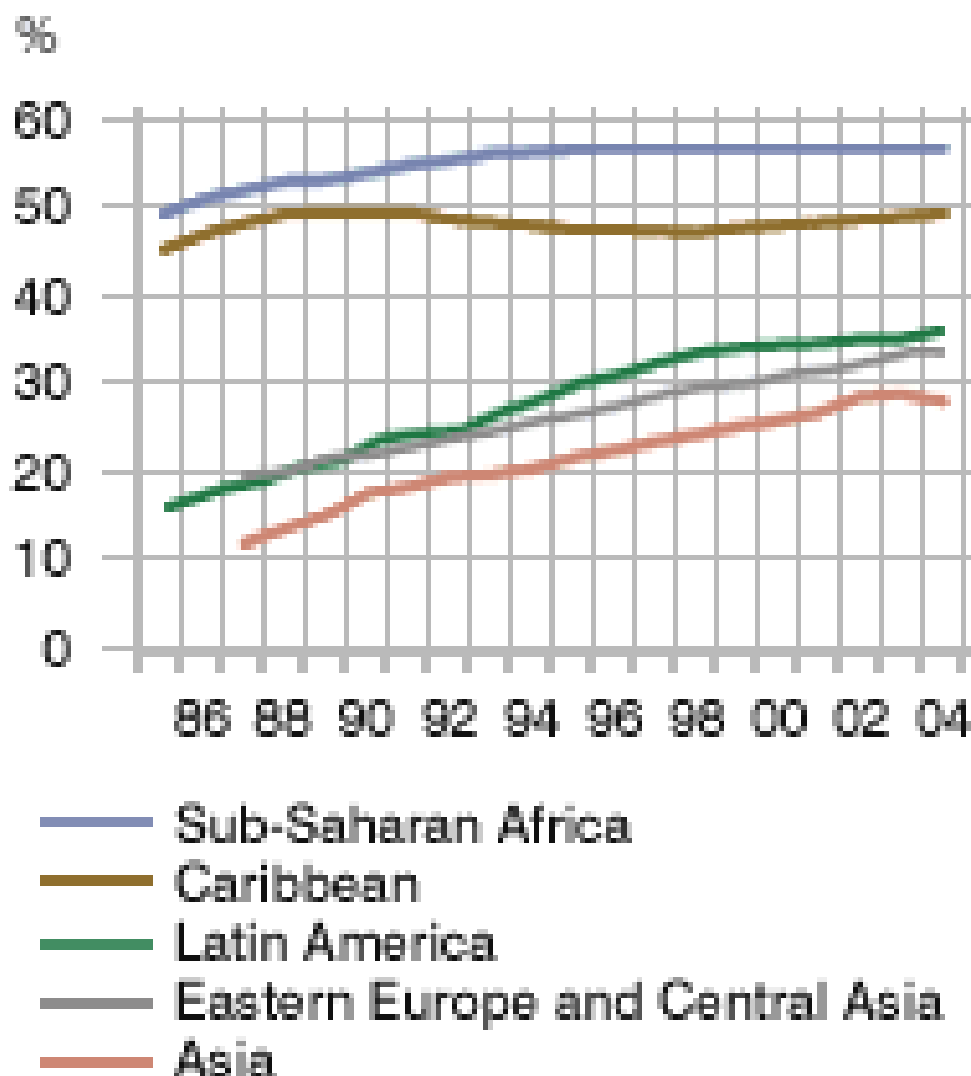
While one in 3,000 White women are infected with HIV, an alarming one out of 160 Black women carry the virus. Years ago HIV-infected women usually contracted the disease through drug use. But these days one of the main methods of infection is heterosexual sex.

In some instances, women are having sex with men infected through drug use. But researchers say that, more than generally suspected, female infection has come through the "bridge" population of men who also have sex with men.



Rise in HIV Among Women

RISE IN HIV AMONG WOMEN



□ HIV transmission correlates highly with HIV viral load of the infected partner,
□ Is most likely with receptive rather than insertive activities,
□ Is 5-fold greater with receptive anal sex versus receptive vaginal sex.

SOURCE: UNAids/WHO

Mother to Child Transmission

SOUTH AND SOUTH-EAST ASIA	18%
MIDDLE EAST AND NORTH AFRICA	7%
SUB-SAHARAN AFRICA	59%
CARIBBEAN	79%
LATIN AMERICA	56%
EAST ASIA AND OCEANIA	43%



COVERAGE
OF
EFFECTIVE
ANTIRETROVIRAL
REGIMENS
FOR
PMTCT

Map shows coverage in low- and middle-income countries.
High-income countries not included. Note that this map does not reflect actual de facto borders.

Coverage of effective antiretroviral regimens for PMTCT

Of the countries with a generalised epidemic, Ghana, Haiti and Namibia are among those that have reached 75 to 100 percent of pregnant women with PMTCT services. Sierra Leone, Cameroon and Rwanda are among those with 50 to 74 percent coverage and Benin, Burkina Faso and Guinea reached only 25 to 49 percent of pregnant women in 2011. Worryingly, PMTCT coverage remains at less than 25 percent among pregnant women living in Chad, Ethiopia and Nigeria.¹⁴

Countries that succeeded in vastly improving coverage of PMTCT services have consequently experienced a significant decline in the number of children newly infected with HIV. In sub-Saharan Africa, home to 92 percent of the world's HIV-positive pregnant women and 90 percent of infected children, a notable decline of 24 percent in the number of new infections was reported during the period 2009 to 2011.¹⁵ Among these countries, Burundi, Kenya, Namibia, South Africa, Togo and Zambia have led the way with the number of new child infections falling by more than half in some places.¹⁶ With sufficient effort, other countries could follow these examples.

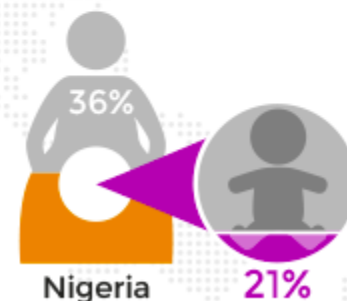
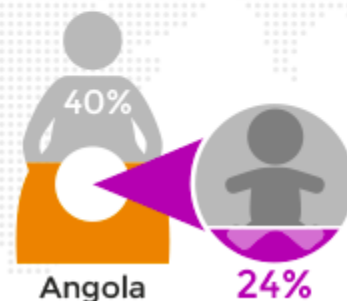
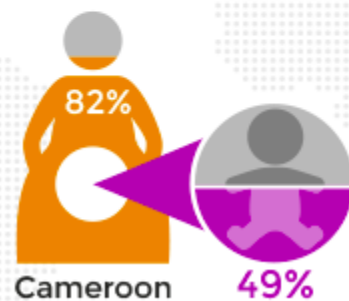
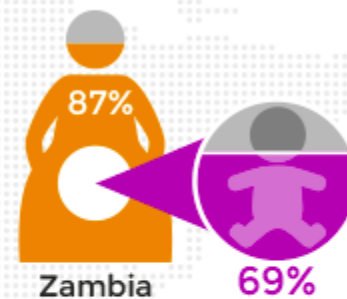
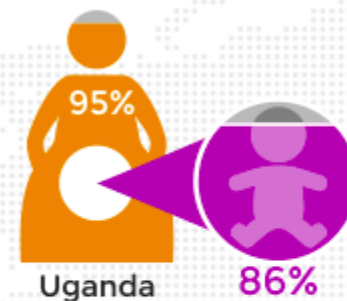
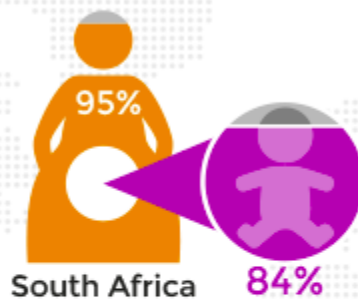
Prevention of mother-to-child transmission progress
against Global Plan targets in selected priority countries

2015

GLOBAL PLAN
2015 TARGETS



Source: UNAIDS (2016)
'On the Fast-Track to an
AIDS-free' generation'



HIV Transmission Risk and Sexual Behavior

- ☐ Transmission depends on HIV viral load and type of sexual behavior.
- ☐ The relative risk for HIV transmission varies from 100% for receptive anal sex, 20% for receptive vaginal sex, 13% for insertive anal sex, 10% for insertive vaginal sex, to 2% for receptive fellatio versus 1% for insertive fellatio.
- ☐ HIV transmission by oral sex between men has been reported
- ☐ HIV transmission is reduced by approximately 80% with condom use.