

**Prevention of Mother to Child Transmission of HIV**  
**Prof. Kay Libbus, University of Missouri-Columbia**  
**A Webber Training Teleclass**

Prevention of Mother to Child  
Transmission of HIV  
Policy, Program and Practice Issues

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Hosted by Paul Webber  
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World Health Organization  
PMTCT Strategic Vision 2010-2015

Preventing mother to child  
transmission of HIV to reach UNGASS  
and Millennium Development Goals

UM Millennium Development Goals

- End Poverty and Hunger
- Universal Education
- Gender Equality
- Child Health
- Maternal Health
- Combat HIV/AIDS
- Environmental Sustainability
- Global Partnership



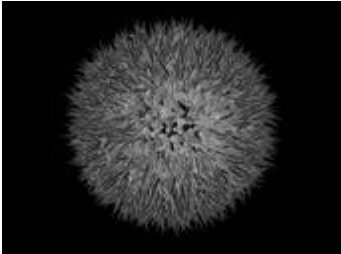
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**Objectives**

- Restate basic information about the HIV virus
- Differentiate between horizontal and vertical transmission of HIV
- Evaluate factors that increase the probability of mother to child transmission of HIV
- Characterize the importance of equal human rights for women who are HIV positive.
- Conceptualize the World Health Organization four element process in eliminating mother PMTCT
- Appreciate the importance of integrating HIV services, reproductive and sexual health services and antenatal services in preventing PMTCT.
- Explain the specific interventions that may be used to reduce PMTCT when women are HIV positive.



**HIV Virus**  
Human Immunodeficiency Virus  
HIV infection precedes full-blown AIDS

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**Two Main forms of HIV**

**HIV -1**

- Causes disease by compromising the body's immune defenses
- Discovered at the Institute Pasteur in 1983
- Responsible for most progression to full-blown AIDS

**HIV-2**

- Causes disease by compromising the body's immune defenses
- Identified among Patients in Cameroon in 1985
- More similar to Simian Immunodeficiency Virus (SIV)
- Less virulent than HIV-1.

**HIV- a Special type of **Retrovirus** containing RNA**

- Replicate backwards – hence the name
- There are other RNA viruses (measles and flu) but these are not retroviruses.
- Three families of retroviruses
  - Oncoviruses (cause cancer)
  - Lentiviruses (slow viruses – HIV is one)
  - Spumaviruses (AKA foamy viruses- much less known about this one.

**HIV Transmission**

- Historically considered a disease in MSM and IDUs
- Horizontal transmission – person to person by way of
  - Sexual contact
  - Transfusion of blood and blood elements
  - IDU
  - Any activity in which body fluids are transferred

**Vertical Transmission**

Transmission from mother to fetus or infant during pregnancy.... (20%)



..during the birth processes (70-80%)

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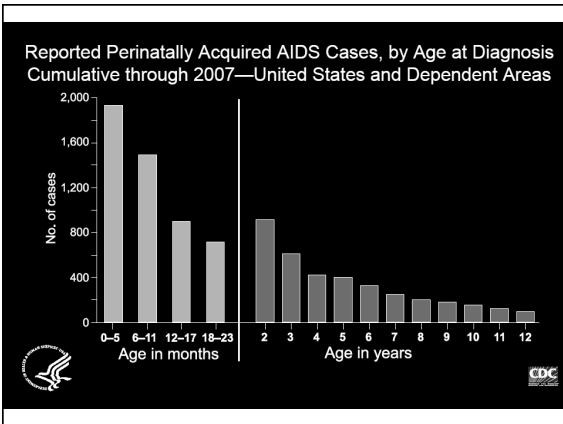


...and during breastfeeding  
 (10-20%)



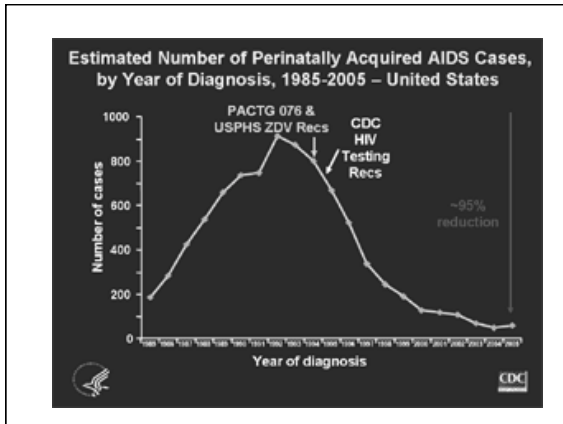
Perinatal Transmission of HIV is a  
 Recurring and Significant Source of  
 New HIV Infection

- United States**
- 8500 Perinatal transmissions (of whom 60% had died by 2005).
  - Gradual Decrease through the course of the epidemic, primary due to timely ID of Maternal HIV and timely interventions to prevent perinatal HIV
  - U.S. Opt-out testing for all pregnant women



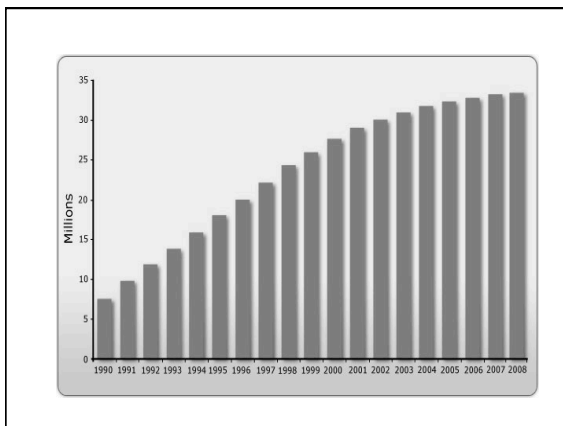
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**Worldwide**

- A minimum of 15 million women infected
- More than 500,000 HIV infected infants born annually
- Without intervention 35% of children born to HIV infected women will be infected
  - 14-32% in non-breastfeeding populations
  - 25-48% in breastfeeding populations

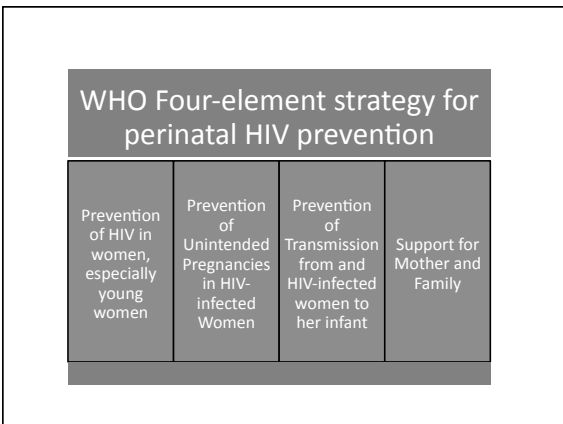


**Human and Civil Rights and HIV**

- Health Care providers may advise HIV+ women to avoid pregnancy and childbirth
- However....
- HIV positive women have the right to have children and family
- Decide on whether and when to conceive
- Decide on the number and spacing of children
- Access to quality reproductive health services

**Children are vital to many people**

- “to have a complete life”
- “To be just like other women”
- “To please the family”
- “To have someone to inherit”
- “there is an inherent need to have a child”
- “ children are a blessing from god”
- “To have someone to care for me when I am old”



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**Element 1: Prevention of HIV in women, especially young women**

- Reduce or eliminate unprotected intercourse
- Association between violence (war, rape) and HIV in women.
- Many women have lack control over all sexual activities and their own fertility

**Element 1**

- Early, consistent, and recurring health and sex education for girls and boys
- Public HIV prevention marketing with rejection of common myths (e.g., virgin cure)
- Prompt reporting of sexual assault with post-assault prophylaxis post rape of coerced sex (AZT)

**Element 2: Prevention of unintended pregnancy in HIV-infected women**

- Availability of sexual health services
- Combination of sexual health and reproductive services with HIV services to reduce stigmatization and improve availability (one stop shopping)
- HIV test as many women as possible as early as possible after becoming sexually active

**Side-Note**

- Much of the lack of linkages between services related to political resistance and funding streams
- Global HIV/AIDS program funds and family planning funds are separate
- Although 15-50% pregnancies in HIV+ women unintended, HIV specified funds cannot be used for family planning
- Caught up in ideological and political debate

**Element 3: Prevention of transmission from HIV + women to their offspring**

- Planned pregnancy when possible
- High CD4 counts and low viral loads
- Avoid pregnancy or consider termination when AIDS-defining conditions are present
- Lower transmission when C-section compared to vaginal delivery
- Rapid delivery after rupture of membranes
- Check for and treat STDs prenatally

**Element 3 (continued)**

- For HIV+ women who are planning pregnancy, avoid potentially teratogenic anti-retroviral drugs (ARV) such as Efavirinaz and Amprenavir that can cause birth-defects
- Assisted Reproduction – eg., Artificial Insemination (AF)
- In Vitro Fertilization (IVF)
- Use washed sperm if partners are sero-concordant (see Thornton et al, 2004)

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#### Element 3 (continued)

- Drug Therapy (ARV/ART)
  - First drug used Zidovudine (AZT or ZDV) -36=38 weeks gestation
  - Stops HIV from infecting uninfected cells in the body but do not help cells that are already infected
  - Concerns about use of one drug only due to potential drug resistance

#### Dual or Combination Drug Therapy

Many therapeutic regimens in use

One Regimen: Daily doses of AZT beginning at 36 weeks, single dose Nivirapine (NVP) during labor; infant receives NVP no later than 72 hours post-birth and 2 days of AZT

Long-term NVP use associated with maternal hepatic dysfunction

See Dao et al. (2007)

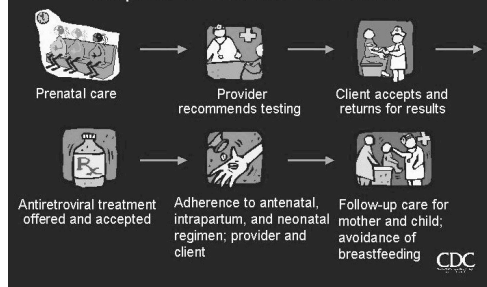
WHO guidelines for PMTCT drug regimens in resource-limited settings from <http://www.avert.org/motherchild.htm>

	Pregnancy	Labour	After birth: mother	After birth: infant
2010 Recommendations option A	AZT after 14 weeks	single dose nevirapine; AZT +3TC	AZT+3TC for seven days	Daily NVP until 1 week after breastfeeding has finished
2010 Recommendations option B	Triple ARVs after 14 weeks	Triple ARVs	Triple ARVs until 1 week after breastfeeding has finished	6 weeks of daily NVP
2006 Recommendations	AZT after 28 weeks	single dose nevirapine; AZT +3TC	AZT+3TC for seven days	single dose nevirapine; AZT for seven days
Alternative (higher risk of drug resistance)	AZT after 28 weeks	single dose nevirapine	-	single dose nevirapine; AZT for seven days
Minimum (less effective)	-	single dose nevirapine; AZT +3TC	AZT+3TC for seven days	single dose nevirapine
Minimum (less effective; higher risk of drug resistance)	-	single dose nevirapine	-	single dose nevirapine

#### Element 3: Infant Feeding

- Robust association between breastfeeding and risk of infant HIV-infection
- Use of substitute feeds or banked breast milk with feeding bottle depending on availability and cultural acceptability (stigma)
- Exclusive breastfeeding or bottle feeding for first 4-6 months
- 6 month limit on breastfeeding followed by indigenous weaning liquids and foods.

#### Steps to Prevention Success



#### Element 4: Support for Mother and Family

- Post-partum support from family, community, and health care system
- Women must continue ARVs post-partum
- Possibility of sterilization if woman (and partner) satisfied with family size
- Reduction of pressure on women to bear a son
- Infants and children monitored months and years following birth.

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#### The Future

- Depoliticize the issues
- Improve linkages between sexual health, reproductive, and HIV services
- Work to reduce stigma
- Improve and protect women's status
- Make medication widely available

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#### THE NEXT FEW TELECLASSES

13 Oct. 10	(South Pacific Teleclass) Infection Control in the Tropics Speaker: Claire Boardman, VICNISS Australia
21 Oct. 10	Methods of Monitoring Hand Hygiene Frequency and Compliance Speaker: Dr. John Boyce, Yale University
28 Oct. 10	Implementing Mandatory Vaccination for Healthcare Workers Speaker: Dr. Keith Woeltje, Washington University School of Medicine
04 Nov. 10	Using Social Marketing to Prevent Healthcare Associated Infection Speaker: Dr. Hugo Sax, University of Geneva, Switzerland
09 Nov. 10	(British Teleclass) Why are Noroviruses Such Successful Pathogens in Healthcare Settings? Speaker: Dr. Christine Moe, Emory University
18 Nov. 10	Infection Prevention Strategies in the Home Care Setting Speaker: Mary McGoldrick, Home Health Systems Inc.
02 Dec. 10	Validation of Special Ventilation Systems in Healthcare Facilities

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