

SECTION 2: The global HIV pandemic and how it affects women and children



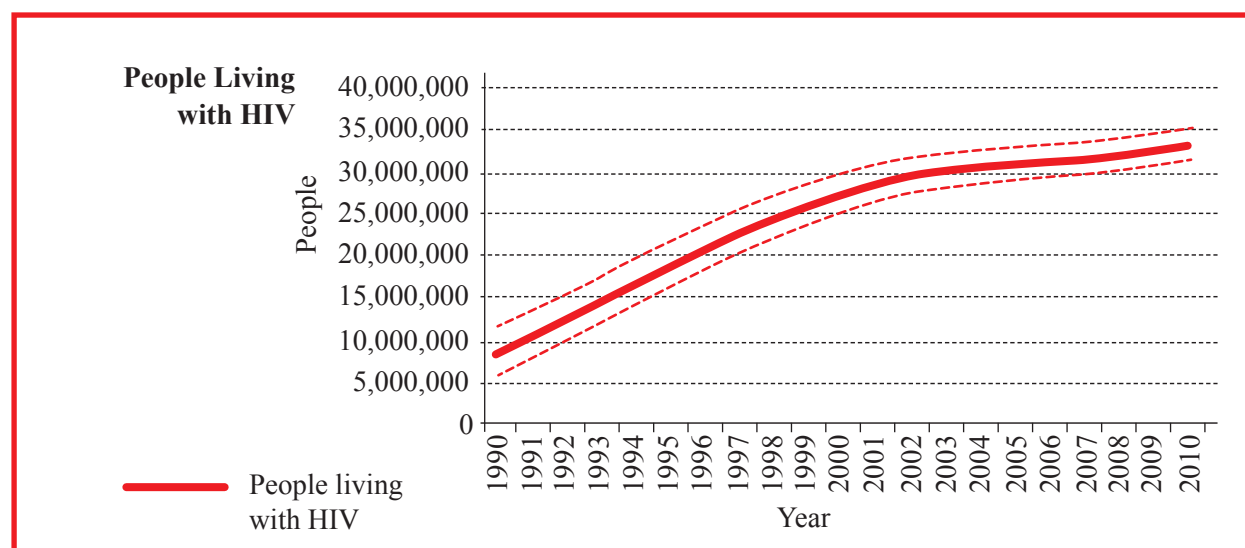
This Section explores the AIDS pandemic's unique impact on women and babies; their vulnerability to HIV, how they become infected, how HIV-infection is determined, and how HIV affects women in the societies and communities in which they live.

HIV-infection in Women

- Half of all 34 million adults worldwide living with HIV in 2011 were women.^{1,2}
- Half of all HIV-positive individuals are aged 15-24 years, of whom 71% are women living in sub-Saharan Africa.³
- Young women aged 15-24 are 8 times more likely than men to be infected.⁴
- Nearly 1.5 million HIV-positive women become pregnant annually.³
- By 2010 only one-third of people living with HIV in low- and middle-income countries had access to the treatment they needed.⁴

Progress and Future Goals

- Annual new HIV infections fell 21% from 1997-2010.¹
- Appropriate treatment could avert an additional 10 million deaths by 2025.⁴



Source: UNAIDS 2011, World AIDS Day Report.

Inequities in HIV Care and Support

The epicentre of the HIV epidemic is Sub-Saharan Africa, which has the highest:

- prevalence of adult and paediatric HIV infection,

1. UNAIDS 2011, World AIDS Day report, available at http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/JC2216_WorldAIDSday_report_2011_en.pdf
2. UNAIDS, November 2011, World AIDS Day Press Release, at <http://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2011/november/20111121wad2011report/>
3. WHO/UNICEF/UNAIDS, Global HIV/AIDS response – Epidemic update and health sector progress towards Universal Access – Progress Report 2011 available at http://whqlibdoc.who.int/publications/2011/9789241502986_eng.pdf
4. UNAIDS 2010, Global Report on the AIDS Pandemic, available at http://www.unaids.org/documents/20101123_GlobalReport_em.pdf

- incidence of AIDS and AIDS-related morbidity and death,
- proportion of HIV and AIDS affected households,
- indicators of food insecurity,
- numbers of humanitarian disasters.⁵

HIV/AIDS is the leading cause of death among women of reproductive age.⁶ Twenty-two countries*, are home to nearly 90% of pregnant women living with HIV in need of services.⁷

In 2011 it was reported that while only 35% of pregnant women worldwide who needed an antiretroviral (ARV) regimen received it,³ maternal mortality due to HIV in high-income countries was virtually zero, as were the number of new pediatric HIV infections. In low income settings where women are still unable to access effective treatments for their own health, postnatal transmission remains unacceptably high, at 20-45%.

Different thresholds are used in recommendations for initiation of ARVs:

- HIV+ adults in developed countries: CD4 count <500 cells/mm³⁸
- HIV+ adults, including pregnant women in developing countries: CD4 count <350 cells/mm³⁹

Women's Biological Vulnerability

- Women often have little choice about conception, pregnancy and breastfeeding.
- They are twice as likely as men to become infected through unprotected sex.
- They are less likely than men to receive treatment for sexually transmitted infections, or they receive treatment later, increasing their risk for infection with HIV.

Gender Inequality

Human rights are no longer considered peripheral to the AIDS response. Today, 89% of countries explicitly acknowledge or address human rights in their national AIDS strategies. Most report that they have programmes in place to reduce HIV-related stigma, and accept that women require special protection from gender-based violence and greater economic independence.⁴ Yet translating these programmes into action remains challenging:

- Women bear the main burden for care of the ill, elderly and young, AIDS patients and orphans.
- Their knowledge about HIV may be limited.
- The economic vulnerability of women, especially younger women, increases high-risk behaviour, eg drug use, sex work, transactional or non-consensual sex and low condom use.

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5. UNAIDS 2008, Report on the global AIDS epidemic, August 2008, available at http://data.unaids.org/pub/GlobalReport/2008/JC1510_2008GlobalReport_en.zip
 6. WHO 2009, Women and health, Today's evidence tomorrow's agenda, Available at <http://www.who.int/gender/documents/9789241563857/en/index.html>
 7. UNAIDS 2011, Countdown to Zero: Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive, 2011-2015, available at http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110609_JC2137_Global-Plan-Elimination-HIV-Children_en.pdf
 8. Thompson MA, Aberg JA, Cahn P, Montaner JSG, Rizzardini G, Telenti A, Gatell JM, Günthard HF, Hammer SM, Hirsch MS, Jacobsen DM, Reiss P, Richman DD, Volberding PA, Yeni P and Schooley R, Antiretroviral Treatment of Adult HIV Infection 2010 Recommendations of the International AIDS Society–USA Panel. *JAMA*, 2010;304(3):321-333
 9. WHO 2010. Antiretroviral drugs for treating pregnant women and preventing HIV infections in infants: Recommendations for a public health approach, 2010 version, available at <http://www.who.int/hiv/pub/mtct/antiretroviral2010/en/>
- * Angola, Botswana, Burundi, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, India, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe

- Women often suffer stigma, sexual violence, including by intimate partners, and discrimination.
- Due to gender inequality which reflects women's disadvantaged position in society, issues which affect their lives are less likely to be monitored and recorded in development, physical, behavioural and sexual indicators.
- Women may have limited choices about infant feeding; both artificial feeding and exclusive breastfeeding may expose women's HIV+ status, subjecting them to stigma.

How HIV Affects Women's Lives

Marriage and motherhood

The mother may be the first person in the family to find she is HIV-infected. HIV usually enters a family through the woman's sexual partner, often the baby's father, and the single largest risk factor for many women is being married. Couples are less likely to use condoms during pregnancy and a new HIV infection often occurs at this time, ie during late pregnancy.¹⁰ Transmission of HIV to the unborn baby and through breastmilk is more likely during the early period of infection, when there is more virus in the woman's blood.¹¹

Fear of disclosure and stigma

Stigma and reluctance to disclose her status may mean that a woman avoids being tested for HIV, or declines treatment. If mixed or shared feeding is usual, she may be afraid to exclusively breastfeed in case people ask questions. Expressing and heat-treating milk would also be very difficult unless a mother's family knew why she was doing it.

Social circumstances and discrimination

HIV infection can make a woman ill, compromising her capacity to work, reducing her income and ability to buy food, and her nutrition and immunity. Poor nutrition in turn undermines her adherence and response to ARVs and hastens the development of AIDS-related illnesses.

Women whose partners die of AIDS may be blamed for their husbands' illness, leading to discrimination and abandonment. Their lower status in the family and community make it less likely that they have access to health care including ARVs. Many women may have decisions made for them by husbands or by women of higher status in the family.

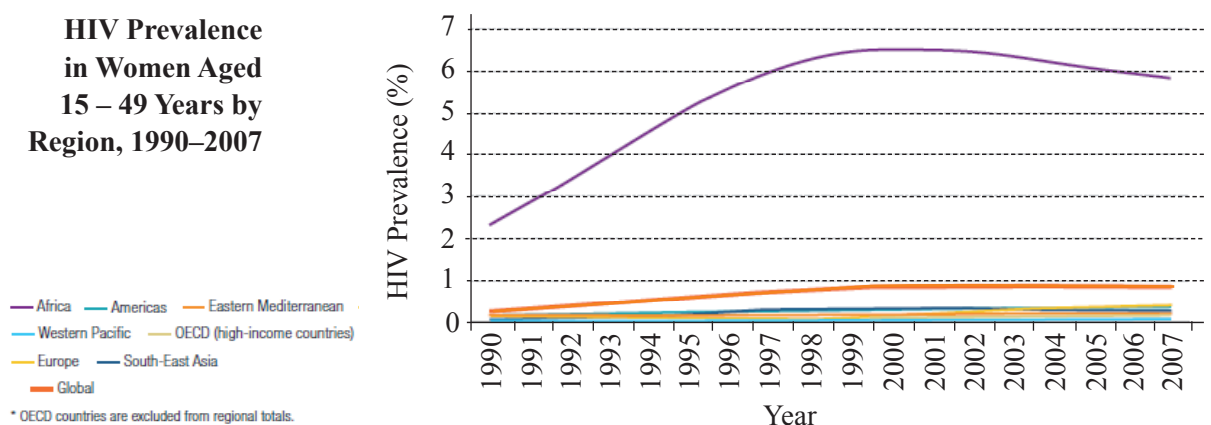
WHO recommends that health sector policies and programmes should empower women and girls to reduce their vulnerability to HIV, challenge harmful gender norms, and contribute to gender equality. Gender-based access to health interventions, such as ARVs, should be addressed in HIV programming. Boys and men need to be included in behavioural and structural interventions aimed at reducing gender inequality.¹²

10. Johnson LF, Stinson K, Newell M, Bland RM, Moultrie H, Davies M, Rehle TM, Dorrington RE and Shermans GG. The contribution on maternal HIV seroconversion during late pregnancy and breastfeeding to mother-to-child transmission of HIV. *Journal Acquir Immune Deficiency Syndrome*. 2012;59: 417 – 425.

11. Dunn DT, Newell ML, Ades AE, Peckham CS. Risk of human immunodeficiency virus type 1 transmission through breastfeeding, *Lancet* 1992 Sep 5;340(8819):585-588.

12. WHO 2011, Global health sector strategy on HIV-AIDS, 2011 – 2015 available at http://www.who.int/hiv/pub/hiv_strategy/en/index.html

HIV Prevalence in Women Aged 15 – 49 Years by Region, 1990–2007



Source: P 43, WHO 2009, Women and Health, today's evidence tomorrow's agenda, citing UNAIDS and WHO Database 2009.

Pediatric HIV

- In the absence of effective ARV regimens 90% of infant HIV infection occurs as a result of transmission during:
 - Pregnancy and delivery (15-25%).¹⁵
 - Mixed breastfeeding through the first 6 months (4-12%).¹⁶

- Any breastfeeding over the course of 2 years (5-20%).¹⁵

Routes of Infection

HIV is a retrovirus, identified in 1983 as the cause of AIDS.¹³

Horizontal Infection. The commonest source of infection is through unprotected sex between men and women, or between men who have sex with men. The risk is highest when the infected individual has high levels of virus in the blood, during a recent infection, or when the immune system has become badly compromised due to active AIDS.

Blood-borne Infection. Individuals can also be infected by receiving a contaminated blood transfusion or other blood products, or by contaminated needles, syringes or knives.

Vertical Infection (also called Postnatal Transmission)

- Babies can be infected by an HIV-positive mother during pregnancy, birth or breastfeeding. The risk of postnatal transmission is particularly high if a woman acquires a new HIV infection, leading to high viral levels in her blood or milk while she is pregnant or breastfeeding.¹⁰ An HIV-positive mother is more infectious when she is not receiving ARV, and when an untreated HIV infection progresses to AIDS.
- Child to mother transmission can occur when an infant nosocomially infected with HIV transmits the virus to an HIV-uninfected woman through breastfeeding. Transmission likely occurs as a result of breastfeeding contact when the mother has damaged or abraded nipples and when the baby has inflammation of the mucous lining of any of the structures in the mouth, which may involve the cheeks, gums, tongue, lips, throat, and roof or floor of the mouth. Despite epidemiologic evidence showing rates of child-to-mother transmission ranging from 40-60% among women reporting breastfeeding after their infants were infected, this route of infection, continues to be overlooked.¹⁴

13. Centres for Disease Control, see <http://www.cdc.gov/hiv/resources/qa/definitions.htm>

14. Little KM, Kilmarx PH, Taylor AW, Rose CE, Rivadeneira ED, Nesheim SR. A Review of Evidence for Transmission of Human Immunodeficiency Virus from Children to Breastfeeding Women and Implications for Prevention. *Pediatr Infect Dis J*. 2012 Jun 4. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/22668802>

15. De Cock KM, Fowler MG, Mercier E, de Vincenzi I, Saba J, Hoff E, Alnwick DJ, Rogers M, Shaffer N: Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. *JAMA* 2000, 283(9):1175-1182

- An unknown percentage of postnatally acquired pediatric HIV may be caused by premastication of food for infants and young children, commonly practised by HIV-positive mothers and other care-givers in both developed and developing countries.^{17, 18, 19} This route of transmission may be facilitated by adult/infant oral thrush, bleeding gums, or infant teething and is often indistinguishable from, and may be wrongly attributed to, postnatal transmission through breastfeeding.
- HIV-infection of children at healthcare facilities has been reported through re-use of injection equipment, and dental and medical procedures including blood transfusions, that fail to observe adequate infection control practices. This also has implications for vertical transmission to previously uninfected mothers.¹⁴
- Pediatric infection can also be caused by body cutting or sexual abuse.^{21, 22}
- 1.49 million children were born to HIV-positive mothers in 2010.³
- 370 000 children became newly infected with HIV in 2009.⁷
- Only 23% of 2.02 million children received needed ARVs in 2010. Conversely, ARV coverage for adults and for pregnant women was 47% and 48% respectively.³
- Without treatment, 30% of HIV-infected children die in the first year of life, 50% before the age of 2.²³
- In countries, such as South Africa that have achieved 90% ARV coverage, the vertical transmission of HIV has been reduced drastically.⁴

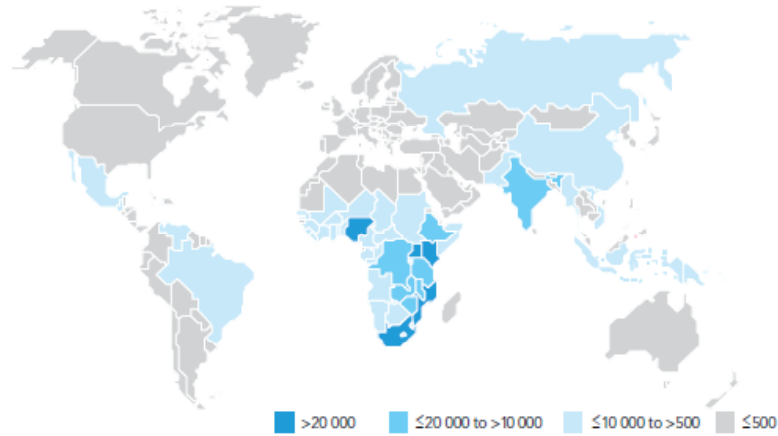
Women's Fertility Aspirations

Family planning will help HIV-infected women make the best reproductive choices and they can safely and effectively use most of contraceptive methods. However, ARVs can decrease or increase the bioavailability of steroid hormonal contraceptives.^{24a}

Notwithstanding initiatives to limit unwanted pregnancies as a means of reducing vertical transmission to infants, HIV-infected women on every continent continue to desire children. Having achieved a pregnancy, all women want, most of all, is for their children to survive and thrive.

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16. Shapiro RL, Smeaton L, Lockman S, Thior I, Rossenkhani R, Wester C, Stevens L, Moffat C, Arimi P, Ndase P, Asmelash A, Leidner J, Novitsky V, Makhema J and Essex M. Risk Factors for early and late transmission of HIV via breast-feeding among infants born to HIV-Infected women in a randomized clinical trial in Botswana. *The Journal of Infectious Diseases* 2009;199:414–8.
 17. Hafeez S, Salami O, Alvarado M, Maldonado M, Purswani M and Hagmann S. Infant Feeding Practice of Premastication: An Anonymous Survey Among Human Immunodeficiency Virus-Infected Mothers, *Arch Pediatr Adolesc Med* 2011; 165(1):92-93, available at <http://archpedi.jamanetwork.com/pdfaccess.ashx?ResourceID=521736&PDFSource=13>
 18. Rakhmanina N et al, Gaur A, et al, Premastication of Food by Caregivers of HIV-Exposed Children — Nine U.S. Sites, 2009–2010, *MMWR*, (Morbidity Mortality Weekly Report) 2011; 60(9):273-275. abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/21389930>. full-text available as second article, at <http://www.cdc.gov/mmwr/pdf/wk/mm6009.pdf>
 19. Maritz ER, Kidd M, Cotton MF. Premasticating food for weaning African infants: a possible vehicle for transmission of HIV. *Pediatrics*. 2011 Sep;128(3):e579-90. Epub 2011 Aug 28, <http://pediatrics.aappublications.org/content/128/3/e579.abstract>
 20. Ivy W 3rd, Dominguez KL, Rakhmanina NY, Iuliano AD, Danner SP, Borkowf CB, Denson AP, Gaur AH, Mitchell CD, Henderson SL, Paul ME, Barton T, Herbert-Grant M, Hader SL, Pérez García E, Malachowski JL, Nesheim SR. Premastication as a route of pediatric HIV transmission: case-control and cross-sectional investigations. *J Acquir Immune Defic Syndr*. 2012 Feb 1;59(2):207-12. Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/22027873>
 21. Patel SV, Shisana O, Kim E, Hakim A, Brewinski M, Kissin D, Zapata L, Murrill C, Nwanyanwu O, Rehle T, Lindegren ML. Filling a gap: HIV pediatric surveillance in resource constrained settings. *JHASE* 2010, 2(1):6. Freely available from: [http://www.ieph.org/ojs/index.php/jHASE/article/viewFile/%5BjHASE%202010%2C%202\(1\)%3A6%5D/31](http://www.ieph.org/ojs/index.php/jHASE/article/viewFile/%5BjHASE%202010%2C%202(1)%3A6%5D/31)
 22. Ganczak M, Barss P. Nosocomial HIV infection: epidemiology and prevention—a global perspective. *AIDS Rev*. 2008 Jan-Mar;10(1):47-61, Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/18385780>
 23. UNICEF 2009, Unite for children, unite against AIDS: Briefing paper, Scaling up Early Infant Diagnosis and Linkages to Care and Treatment, available at <http://www.unicef.org/aids/files/EIDWorkingPaperJune02.pdf>
 - 24a. WHO 2010. Priority Interventions: HIV/AIDS prevention, treatment and care in the health sector, available at http://whqlibdoc.who.int/publications/2010/9789241500234_eng.pdf

Number of New HIV Infections among Children, 2009



Source: UNAIDS 2011 Countdown to Zero: Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive⁷

HIV-free Child Survival

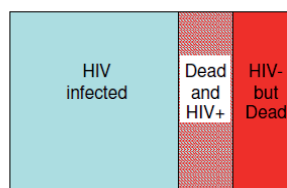
This term means that a child is alive and well and has a negative HIV test at a particular time point. Nearly 7 million children died in 2011 from causes other than HIV/AIDS.^{24b} It is estimated that 1.5 million young children die because they are not breastfed optimally, whereas 300,000 (2%) die of HIV acquired through breastfeeding.²⁵

The most frequent causes of preventable child mortality are:

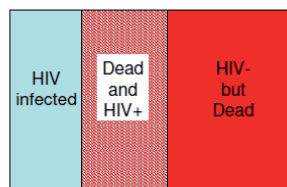
- pneumonia (18%),
- diarrhoeal diseases (15%),
- undernutrition as an underlying cause (>33%).²⁷

Programmes to prevent HIV transmission to infants must also avoid increasing the risk of mortality or morbidity from other childhood illnesses by discouraging breastfeeding. Unless safe alternative methods of artificial feeding are available, continuing to promote breastfeeding has been shown to increase HIV-free survival.

Infant Feeding and HIV-free Survival



Breast feeding increases HIV-transmission but reduces mortality from other causes

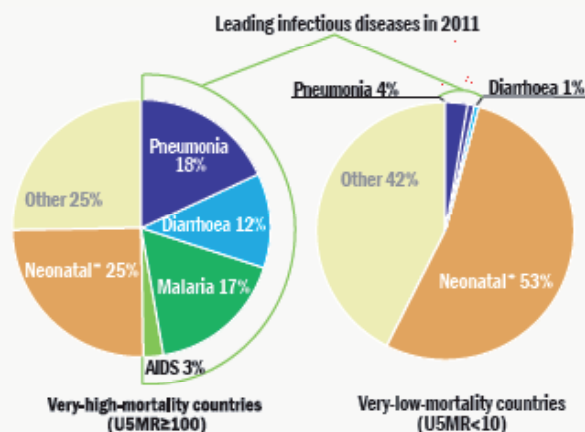


Replacement (formula) feeding reduces HIV-transmission but increases mortality from other causes

Source: B Williams, HIV-free survival in infants ARV and breastfeeding or replacement feeding: What is the best strategy?²⁶

- 24b. UNICEF 2012, Levels & trends in mortality. Report 2012, Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation, Available at <http://www.unicef.org.uk/Documents/UNICEF%20Child%20mortality%20report%202012.pdf>
25. Coovadia H, NPR California Podcast, HIV-Positive: OK to Breast-feed? on acceptance by scientific community of reduced risk of breastfeeding compared to formula-feeding for HIV-infected mothers in Africa and Asia, 8 June 2007, <http://www.npr.org/templates/story/story.php?storyId=10857501>
26. WHO 2010, Annexure 7b to Guidelines on HIV and infant feeding. Williams B, HIV-free survival in infants ARV and breastfeeding or replacement feeding: What is the best strategy? Available at http://www.who.int/maternal_child_adolescent/documents/9789241599535_annex_7a.pdf
27. UNICEF 2011, Levels & trends in child mortality, Report 2011, available at http://www.unicef.org/media/files/Child_Mortality_Report_2011_Final.pdf

Causes of Under-five Deaths in Very-high-mortality Countries and in Very-Low Mortality Countries



Very-high-mortality countries are those with a U5MR of at least 100 deaths per 1,000 live births in 2011.

Very-low-mortality countries are those with a U5MR of at least 10 per 1,000 live births. Pneumonia and diarrhoea include neonatal period.

* Excludes pneumonia and diarrhoea during neonatal period.

Source: UNICEF 2012, Progress report, Committing to child survival, a promise renewed http://www.unicef.org/media/files/APR_Progress_Report_2012_final.pdf

Preventing HIV infection of infants:

With appropriate interventions ⁷ HIV transmission to infants can be reduced to between <2% ²⁸ and 5%. ²⁹ These include:

- primary prevention of HIV infection in women;
- prevention of unintended pregnancies;
- provision of ARVs, care and support for HIV-positive women, to maintain their own health;
- ARVs and safe delivery practices to prevent HIV-transmission during pregnancy and childbirth;
- ARVs and skilled pre- and post-natal infant feeding counselling to prevent transmission during breastfeeding.

HIV testing

Effective ARV regimens have transformed HIV from a lethal into a chronic disease. However, if women are to receive treatment and other help for HIV, they need first to be tested to see if they are infected.

In 2007, WHO and UNAIDS issued new guidelines ³⁰ advocating for provider-initiated HIV testing and counseling (PITC):

- for all patients who present with signs or symptoms of underlying HIV disease,
- in all healthcare facilities in countries where HIV-prevalence exceeds 1%.

In 2010 WHO suggested ²⁴ that PITC should:

- require informed consent,
- provide sufficient information for clients to make an informed decision,
- enable clients to decline testing,
- be done in private,
- tailor post-test counselling to the test result,
- guarantee confidentiality.

28. Shapiro RL, Hughes MD, Ogbu A, Kitch D, Lockman S, Moffat C, Makhema J, Moyo S, Thior I, McIntosh K, van Widenfelt E, Leidner J, Powis K, Asmelash A, Tumbare E, Zwierski S, Sharma U, Handelsman E, Mburu K, Jayeoba O, Moko E, Souda S, Lubega E, Akhtar M, Wester C, Tuomola R, Snowden W, Martinez-Tristani M, Mazhani L and Essex M. Antiretroviral Regimens in Pregnancy and Breast-Feeding in Botswana. *New England Journal of Medicine* 2010;362:2282-94. Available at <http://content.nejm.org/cgi/reprint/362/24/2282.pdf>

29. Kesho Bora Study Group, Triple antiretroviral compared with zidovudine and single-dose nevirapine prophylaxis during pregnancy and breastfeeding for prevention of mother-to-child transmission of HIV-1 (Kesho Bora study): a randomised controlled trial, *The Lancet* 2011; DOI:10.1016/S1473-3099(10)70288-7

30. WHO 2007, Guidance on provider-initiated HIV testing and counseling in health facilities available at: http://www.who.int/hiv/who_pitc_guidelines.pdf

Healthcare providers should recommend PITC:

In low-level concentrated epidemics, where patients are attending STI clinics, antenatal, childbirth and postpartum services, or TB and hepatitis related services

In generalised epidemics, for all patients attending health facilities regardless of whether they show symptoms of HIV-infection and as early as possible for pregnant women.

In all epidemics, for:

- HIV-exposed children prior to post-exposure prophylaxis, and
- all children whose clinical presentation might result from underlying HIV infection

Between 2009 and 2010 HIV testing and counselling of pregnant women in low- and middle-income countries increased from 26% to 35%.³ In sub-Saharan Africa, the region with the highest number of pregnant women living with HIV, coverage increased from 35% to 42%, with especially high increases in countries in eastern and southern Africa; from 52% to 61%.³

People who fail to be tested miss the opportunity for treatment, care, support and prevention. This may happen for many reasons:

- lack of access to testing services,
- fear that the test will be positive,
- fear of stigma and discrimination, and/or
- lack of access to treatment, including constraints due to gender inequality.

When mothers are tested

HIV testing and counselling as early as possible during pregnancy enables women to benefit from prevention, treatment and care and to access interventions for reducing HIV transmission to their infants. Counselling, including before HIV testing test if possible, can help to address many concerns that women have. Counselling of a couple together, and in the home, is often more helpful than counselling one partner alone at a clinic. Repeat testing during late pregnancy has recently been recommended for mothers who have tested negative in early pregnancy.¹⁰

Infant testing

Early testing of infants in South Africa, e.g., at the six-week immunisation clinic, has been found to reduce missed opportunities along the PMTCT cascade.³¹ PITC at this time has helped to combat a reported low intention by mothers to have their infants tested, enabling early treatment of babies in need of ARV therapy. Infant testing at six weeks postpartum also enables prompt treatment of mothers who became newly infected during late pregnancy, or may have self-reported HIV-negative status for fear of stigma.

What tests are used?

HIV infection and accompanying immuno-suppression is detectable by various tests, e.g.:

- ELISA which detects antibodies to HIV,
- PCR which detects viral copies,
- CD4 counts to monitor immune function.

31. Goga AE, Dinh TH, Jackson DJ for the SAPMTCTE study group. Evaluation of the Effectiveness of the National Prevention of Mother-to-Child Transmission (PMTCT) Programme Measured at Six Weeks Postpartum in South Africa, 2010. South African Medical Research Council, National Department of Health of South Africa and PEPFAR/US Centers for Disease Control and Prevention. 2012

ELISA Testing

The Enzyme Linked Immunosorbent Assay (ELISA) is relatively inexpensive and tests for antibodies to HIV. There is a 'window period' of 3 to 12 weeks, between infection and the appearance of antibodies when HIV can be passed to another person more easily because an individual may test negative, but may have high levels of HIV in their blood, semen, vaginal fluids and breastmilk.

Thus If an antibody test is negative, the person needs another test after 3 months to be sure that they are not infected – and they need to practise safe sex to avoid infection during that time.

An infant under 12 months will test positive on ELISA due to circulating maternal antibodies. Before 18 months a PCR test is required to make a definitive diagnosis of HIV infection in children. ELISA testing of children is more accurate after 18^{32a} to 24^{32b} months to detect an HIV-infected child's own antibodies.

PCR Testing

Polymerase Chain Reaction (PCR) tests for viral DNA or RNA. PCR tests are usually more expensive and technically difficult, though specimens can be collected on filter papers which are easily transported to a central laboratory, even in tropical conditions. A PCR will give an earlier diagnosis of HIV-infection because the window period is shorter. Early versions of the PCR did not always test for all HIV sub-types, and not all PCR tests have the same sensitivity. The choice of assay should be dictated by the prevailing HIV sub-types in the country.³³

WHO recommends PCR testing of HIV-exposed infants by 4-6 weeks of age³⁴ when it will be possible to detect low levels of circulating virus in the infant's blood. A child is classified as having early (in utero) infection if HIV is detected within 48 hours of delivery using PCR or viral culture.³⁵ Early testing is important so that infected infants can immediately start ART to improve their chances of survival, regardless of clinical or immune status. A second confirmatory HIV test should be done, but this should not delay starting ART.³³ A recent South African study warns that falling vertical transmission rates reduce the positive predictive value of a single HIV DNA PCR test result, necessitating adaptations to diagnostic algorithms to avoid misdiagnosis and inappropriate treatment, especially with early initiation of ARVs in asymptomatic infants.^{32a}

Rapid Tests

These are recommended when there are efforts to expand access to testing in community settings where laboratory services are weak or absent. They do not require specialized equipment, allow a quick turnaround, usually have internal

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- 32a. Feucht, U., Forsyth, B. And Kruger, M. False-positive HIV DNA PCR testing of infants: Implications in a changing epidemic. *South Africa Medical Journal*. 2012;102: 149 – 152
- 32b. Gutierrez M, Ludwig DA, Khan SS, Chaparro AA, Rivera DM, Cotter Am and Scott GB, Has Highly Active Antiretroviral Therapy increased the time to seroreversion in HIV exposed but uninfected children? *Clin Infect Dis*. 2012, doi: 10.1093/cid/cis662 available at <http://cid.oxfordjournals.org/content/early/2012/07/31/cid.cis662>
33. Creek TL, Sherman GG, Nkengasong J, Lu L, Finkbeiner, Fowler MG, RivadeneiraE, Shaffer N. Infant human immunodeficiency virus diagnosis in resourcelimited settings: issues, technologies, and country experiences. *Am J Obstet & Gynecol, Supplement* 2007;S64-S71
34. WHO 2010. Antiretroviral therapy for HIV infection in infants and children: towards universal access. Recommendations for a public health approach. 2010 revision. Geneva, World Health Organization, 2010 available at http://whqlibdoc.who.int/publications/2010/9789241599801_eng.pdf
35. Bagasra O 1998, Is infection with HIV-1 possible during delivery and breastfeeding? Guest Editorial *AIDS Newsletter* 13(2): 1-2.

controls and can be operated by trained non-laboratory personnel, including lay service providers.²⁴ However almost all rapid tests detect HIV antibodies, and rapid testing may not identify newly infected individuals, and may perform poorly with clade C HIV-1, the predominant sub-type in countries with the highest HIV-prevalence.³⁶

CD4 Counts

CD4 cell counts are used to monitor the progress of HIV. A healthy individual has a CD4 cell count of around 700 to 1,000 cells per cubic millimetre (mm³) of blood. Within weeks of an initial HIV infection, the CD4 count falls sharply, followed by a small recovery and increase, then a second slower decline over time. With a high CD4 cell count of >500 mm³ the risk of postnatal transmission is relatively low. Nevertheless, recently updated programmatic guidance recommends triple ARVs for all pregnant women as soon as diagnosed, and continuing for life.³⁷ Good health and nutrition as well as ARVs can help to keep the CD4 cell count high.

Antiretroviral Interventions

- Drugs developed to disrupt the action of HIV are known as antiretrovirals (ARVs). Treatment with ARVs is called antiretroviral therapy (ART). The aim is to reduce the amount of HIV in the patient's body - their viral load - ideally to an undetectable level, and guidance on ART is constantly being updated.
- Individuals have usually received ART for their own health if their CD4 cell count fell below a certain number of viral copies per cubic millimetre of blood.
- In the past, pregnant or breastfeeding mothers may have received additional ARV prophylaxis to prevent vertical transmission to their babies, e.g., a combination of three or more drugs that attack the virus in several ways at the same time. This form of ART is called highly active antiretroviral therapy, or HAART.
- Neither ART nor HAART is a cure. If treatment is discontinued the virus becomes active again, so a person who has started on ART needs to take it for life.
- Recent research indicates that appropriate ARV regimens (known as treatment-as-prevention) will reduce both:
 - Horizontal transmission: between adults during sex,³⁸ or
 - Vertical transmission: during pregnancy, birth or breastfeeding.²⁸

Revised Antiretroviral Regimes

- In 2010 WHO recommended antiretroviral medicine ARV recommendations for women known to be HIV-infected, and their infants, for their own health and to reduce HIV transmission through breastfeeding, beginning in early pregnancy and, for the first time, continuing throughout the breastfeeding period.⁹
- In April 2012 WHO updated the 2010 guidance³⁹ to recommend that triple-therapy ARVs should be provided to the mother beginning in the antenatal period and continued for life. Infant prophylaxis is recommended from birth for 4-6 weeks.

36. Pebody R, Rapid 'combination' test fails to detect many cases of acute HIV infection, AIDSMap News, 6 January 2012, available at <http://www.aidsmap.com/page/2204685/>

37. WHO 2012, Programmatic update; Use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants, Executive Summary April 2012, available at http://whqlibdoc.who.int/hq/2012/WHO_HIV_2012.8_eng.pdf

38. Cohen, MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, Hakim JG, Kumwenda J, Grinsztejn B, Pilotto JHS, Godbole SV, Mehendale S, Chariyalertsak S, Santos BR, Mayer KH, Hoffman IF, Eshleman SH, Piwowar-Manning E, Wang L, Makhema J, Mills LA, de Bruyn G, Sanne I, Eron J, Gallant J, Havlir D, Swindells S, Ribaudo H, Elharrar V, Burns D, Taha TE, Nielsen-Saines K, Celentano D, Essex M, and Fleming TR for the HPTN 052 Study Team. Prevention of HIV-1 Infection with Early Antiretroviral Therapy, *New Engl J Med* 18 July, 2011; 10.1056/NEJMoa1105243., available at <http://www.nejm.org/doi/pdf/10.1056/NEJMoa1105243>

39. WHO 2012, Programmatic update; Use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants, Executive Summary April 2012, available at http://whqlibdoc.who.int/hq/2012/WHO_HIV_2012.8_eng.pdf

- A large number of women continue to receive sub-optimal drugs such as single-dose nevirapine as the main HIV prophylaxis. This must be phased out as a matter of priority. Current WHO guidelines recommend that pregnant HIV-positive women receive combined therapy, rather than single-dose NVP^{3,9} and that it should be continued for life.³⁹
- Infants found to test HIV-positive are recommended to start immediate ARV therapy, even if asymptomatic.³⁴

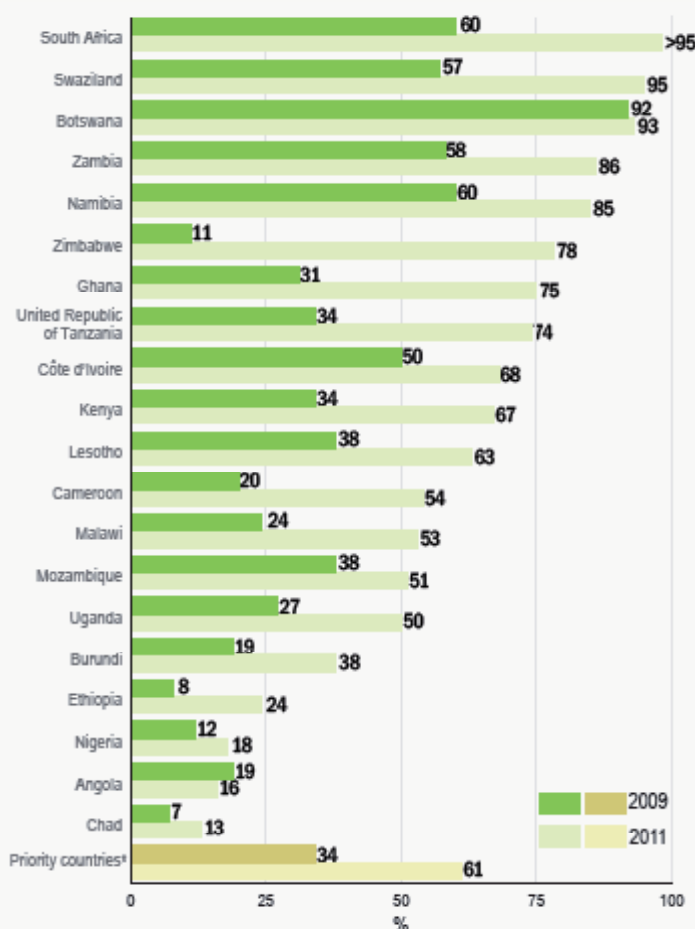
Implementing Current Guidelines: A Win-win Situation

Underpinning current guidance is up-to-date research showing that appropriate ARV regimens for HIV-positive women:

- improves their health,
- allows them to live a normal life-span,
- reduces their infectivity to their babies during pregnancy, birth and breastfeeding.

These findings, (expanded in Section 3) finally permit modification of previous PMTCT initiatives where mothers were provided with ARVs during pregnancy, delivery and breastfeeding, only to have this life-saving medication withdrawn as soon as the baby was born. In addition, due to the continuing risk of postpartum infection, previous PMTCT guidance recommended against breastfeeding, forcing HIV-positive women to relinquish an important and satisfying way of mothering their babies, increasing the risk of infant morbidity and mortality, and frequently exposing formula-feeding mothers' HIV-status to others.

Coverage of Most Effective Antiretroviral Medicine for Preventing Mother-to-child Transmission of HIV During Pregnancy and Delivery. PMTCT Priority Countries, 2009 and 2011.



* Data for priority countries represents the average of 20 of 22 PMTCT priority countries for which 2009 and 2011 HIV estimates are available, excluding the Democratic Republic of the Congo and India.

Source: UNICEF 2012, Progress report, Committing to child survival, a promise renewed http://www.unicef.org/media/files/APR_Progress_Report_2012_final.pdf

Current recommendations for a return to breastfeeding with maternal ARV treatment and infant prophylaxis have been carefully compiled on the basis of accumulating evidence over the last decade. They have been designed to enhance the health and survival of both women and their babies. For the first time, elimination of postnatal transmission, even in resource-limited settings, is an achievable goal which awaits only implementation.

“The life of a child and a mother has the same value, irrespective of where she or he is born and lives”⁷

Key Points Section 2: The Global HIV Pandemic and How it Affects Women and Children

- Gender inequality and women’s unique biology make them especially vulnerable to HIV-infection.
- Women need protection from HIV infection, access to contraception and HIV-testing.
- Testing is usually the entry point for HIV prevention, care and treatment.
- HIV-infected women need access to ARVs, and care and support for themselves and their babies
- In the absence of any intervention, 90% of HIV-infection in infants and children occurs as a result of transmission during pregnancy, delivery or breastfeeding. Current interventions can reduce this toll to almost zero
- Global, national and community leaders have an opportunity to act in concert to support prevention of vertical transmission of HIV to infants and to save the lives of their mothers,
- Universal HIV treatment, care and support provides the means to cut new infection rates and scale up prevention of vertical transmission to the next generation, and save the lives of mothers.

Section 3 outlines interventions shown to improve the health and lives of HIV-positive mothers, reduce vertical transmission and maximise child survival

References and further reading are listed in Section 6.



The World Alliance for Breastfeeding Action (WABA) is a global network of individuals and organisations concerned with the protection, promotion and support of breastfeeding worldwide. WABA action is based on the Innocenti Declaration, the Ten Links for Nurturing the Future and the Global Strategy for Infant & Young Child Feeding. WABA is in consultative status with UNICEF and an NGO in Special Consultative Status with the Economic and Social Council of the United Nations (ECOSOC).