

# Perinatal Transmission of HIV is Preventable

Prepared by Sarah Gutin, MPH. CAPS/Community Health Systems - UCSF School of Nursing.

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In 2012, there were 2.3 million new HIV infections globally [1]. A large proportion of people newly diagnosed with HIV worldwide are in their reproductive years and these men and women are likely to want children in the future [2-4]. Addressing the sexual and reproductive health and rights of this population is critical to addressing the spread of HIV because HIV infection in childbearing women is the main cause of HIV infection in children [5]. Treatment for those who are already infected is also central to stopping the spread of HIV to infants and to uninfected sexual partners.

## How does transmission occur?

Perinatal transmission of HIV, also called vertical transmission, occurs when HIV is passed from an HIV-positive woman to her baby during pregnancy, labor and delivery or breastfeeding. For an HIV-positive woman not taking HIV medications, the chance of passing the virus to her child ranges from about 15 to 45 % during pregnancy, labor and delivery. If she breastfeeds her infant, there is an additional 35 to 40% chance of transmission [6].

## Is the risk of perinatal transmission always the same?

No. Global societal and economic inequities create a wide gap between women in developing nations and women in developed nations with regard to HIV prevention, voluntary counseling and testing and access to drugs which treat HIV infection and can prevent perinatal transmission.

*Developed countries* - In many developed countries, pediatric HIV has been virtually eliminated [7]. In the US in 1994, the Public Health Service recommended HIV counseling and voluntary testing and AZT therapy for all pregnant women after the clinical trial known as "076" showed that AZT reduced rates of MTCT by two-thirds. Since then, a combination of interventions that includes treatment with ART to control the virus and make it undetectable, cesarean delivery, and avoidance of breastfeeding has helped further reduce perinatal transmission in the US, from an estimated 1,500 cases in 1992 to an estimated 162 perinatal infections in 2010 [8]. Although the estimated number of perinatal HIV infections in the US continues to decline, women of color, especially black/African American women are disproportionately affected by HIV infection and as a result, perinatal HIV infection is highest among blacks/African Americans (63%), followed by Hispanics/Latinas (22%) [8]. Although effective interventions have led to a significant reduction in the number of perinatal infections in the US, perinatal transmission still occurs. To close the final gap, the CDC has proposed a new framework to eliminate mother-to-child HIV transmission (EMCT) in the US [8].

This framework focuses on key areas including: comprehensive reproductive health care (that includes both family planning (FP) and preconception care) and comprehensive case-finding of pregnancies in HIV-infected women that is conducted through comprehensive clinical care and case management services for women and infants; case review and community action; continuous quality research in prevention and long-term monitoring of HIV-exposed infants; and thorough data reporting for HIV surveillance at the state and local health department levels [8 9].

*Developing countries* - Unfortunately, perinatal transmission of HIV continues to plague many developing countries despite recent prevention acceleration. In 2008, an estimated 1.4 million pregnant women in low and middle-income countries were living with HIV, of whom about 90% were in sub-Saharan African countries [7]. In 2012, UNAIDS reported that approximately 210,000 children became HIV infected [1].

## Can perinatal transmission of HIV be reduced?

Yes. Perinatal transmission encompasses a variety of highly effective interventions that have huge potential to improve maternal and child health. Advances in treatment and new classes of drugs have provided the opportunity to greatly reduce rates of perinatal transmission worldwide. Also, perinatal transmission can be reduced by preventing unintended pregnancies. Preventing unintended pregnancies is one of the most effective ways to prevent HIV infection in infants and stop spread of the epidemic to children [10]. For that reason, preventing unintended pregnancies among women living with HIV and offering family planning to delay, space or end childbearing is one of the four WHO pillars in the comprehensive approach to preventing perinatal transmission [7]. However, we have still not addressed the root cause of perinatal transmission, mainly heterosexual HIV transmission. The best way to prevent perinatal HIV transmission is to prevent HIV transmission in the mother and father.

In order to reduce perinatal transmission, all pregnant women should have access to free or low-cost prenatal care and voluntary HIV testing and counseling. If a pregnant woman is HIV-positive, she should have access to lifelong ART to treat HIV and improve her own health and to decrease the chances of HIV infection in her infant. In June 2013, the WHO published updated guidelines on the diagnosis of HIV, the care of people living with HIV (PLHIV) and the use of ART for treating and preventing HIV infection [1].

In the US, the Department of Health and Human Services recommends that all HIV-infected pregnant women should be given ART during pregnancy to prevent perinatal transmission of HIV, regardless of whether ART is indicated for the woman's own health [11]. Perinatal transmission can be reduced to less than 2% if a woman is on ART, has a low or undetectable viral load, follows the recommended treatment regimen and does not breastfeed [7-8]. Careful management during labor and delivery can also help reduce perinatal transmission, for example by avoiding unnecessary instrumentation and not prematurely rupturing membranes [12].

Also, although universal prenatal HIV testing is the standard in the US, if prenatal care has not been provided, the patient has HIV, or her HIV status is undocumented, it is critical for hospitals to determine a laboring patient's HIV status upon admission. Even without the use of ART during the pregnancy, the use of ART during labor and for the infant can reduce the risk of perinatal transmission to between 6 to 13% [13]. It is therefore recommended that rapid HIV testing be performed in Labor and Delivery units on pregnant women with no HIV test during their pregnancy or with risk factors for infection since their last test [14].

In developing countries, perinatal transmission has been a priority since 1998, following the success of short-course zidovudine and single-dose nevirapine clinical trials [7]. In recent years, single-dose nevirapine as the primary antiretroviral medicine option for HIV-positive pregnant women to prevent transmission to their infants has been phased out, in favor of more effective and simplified triple ART regimens [1]. The WHO now recommends that all pregnant and breastfeeding women with HIV, regardless of CD4 count or clinical stage, should initiate a triple ART regimen which should be maintained for the duration of perinatal transmission risk, which includes pregnancy, delivery and throughout the breastfeeding period (this is known as Option B). In countries where more than one percent of the population has HIV (these are known as generalized epidemics) and where there is often limited access to tests that indicate the severity of HIV illness (such as CD4 testing), limited partner testing, long duration of breastfeeding and high rates of fertility, the WHO recommends that women meeting treatment eligibility criteria should continue lifelong ART (this strategy is referred to as Option B+) [12]. There are many benefits to lifelong treatment for all pregnant and breastfeeding women and these include increased coverage of those needing ART for their own health, a reduction in the number of women stopping and starting ART during repeat pregnancies, early protection against perinatal transmission in future pregnancies, reduced risk of infecting a partner who is HIV-negative and decreased risk of medication failure or the development of resistance [12].

The ultimate goal is to find the most effective and sustainable regimens for HIV treatment and the prevention of perinatal transmission worldwide. Economics, politics, poor infrastructure, access to healthcare and medications, stigma and cultural norms all pose significant challenges to providing this standard of care everywhere and not all PLHIV have equal access to treatment.

## What are the barriers to the prevention of perinatal transmission?

Pregnant women face many difficult decisions, including decisions around HIV testing, treatment options and infant feeding. Understanding the barriers that women face and addressing barriers at various levels can help in realizing the full potential of prevention of perinatal transmission programs.

A recent review article found that barriers to the prevention of perinatal transmission often fell into three broad categories that included the individual, their partners and community, and health systems [15]. At the individual level, studies suggest that a lower maternal education level, younger maternal age, and poor knowledge of HIV transmission and ART are associated with not receiving and/or not taking ART in order to treat and prevent the spread of HIV [15].

Additionally, a woman's male partner(s), extended family, greater community and health care setting all influence her decision and ability to take advantage of prevention of perinatal transmission programs. Many qualitative studies have found that stigma regarding HIV status and fear of disclosure to partners and family members is a major barrier to the uptake of perinatal prevention interventions [15]. Women living with HIV also continue to report that stigma and discrimination, especially in health care settings, continue to be a barrier to accessing adequate information and services [1]. In various studies, PLHIV have reported negative staff attitudes and this has been cited as a barrier to returning to facilities for care [15].

In developing countries, health systems issues are also a barrier to greater prevention uptake. Key barriers that have been identified include a shortage of trained clinic staff, high patient volumes, long wait times, and brief and poor counseling sessions [15]. In addition, a lack of access or shortages of medications, including ART, as well as stock-outs of HIV test kits and condoms have been reported. Poor access to healthcare overall (long distances to facilities) and poor integration of services also contributes to low ART uptake.

## What about breast feeding?

Breastfeeding is usually the healthiest choice for both infants and mothers. However, HIV transmission can occur during breastfeeding, with chances of transmission increasing the longer the infant is breastfed. In the countries with the highest perinatal HIV rates, it is estimated that more than half of the children newly infected with HIV acquire it during the breastfeeding period [1]. However, the risk of transmitting HIV to infants through breastfeeding is low in the presence of ART [12]. Therefore, providing ART to mothers throughout the breastfeeding period is a critical step needed to further reduce rates of perinatal transmission [1]. It is recommended that HIV-positive mothers do not breastfeed when formula feeding is safe, well accepted and readily available. In the US, both the Centers for Disease Control and Prevention and the American Academy of Pediatrics recommends that HIV-infected women refrain from breastfeeding regardless of their ART status to avoid postnatal transmission of HIV to their infants through breast milk [16-17].

However, formula feeding requires clean water for mixing formula. Many women in developing countries do not have access to clean water or sanitation and cannot afford formula, and therefore cannot avoid breastfeeding. In developing countries where breastfeeding is the norm, formula feeding may also alert a woman's family or community that she is HIV-positive, which may result in stigma or other negative repercussions.

Therefore, the WHO recommends that when breastfeeding is unavoidable, mothers should take ART while breastfeeding and that infants should receive 6 weeks of prophylaxis with once-daily nevirapine [12]. The WHO further recommends that mothers known to be infected with HIV (and whose infants are HIV uninfected or of unknown status) should exclusively breastfeed for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life. It is recommended that breastfeeding should only stop when a nutritionally adequate and safe diet without breast-milk can be provided [12]. Access to ARVs during this extended breastfeeding period is critical [12].

## What's being done?

*Primary prevention of HIV among men and women of childbearing age:* Various tools are now available to prevent HIV infections in men and women of childbearing age. Pre-exposure prophylaxis (PrEP), which is a special course of HIV treatment that aims to prevent people from becoming infected with HIV, has been found to protect against HIV-1 infection in heterosexual men and women and reduce HIV transmission by 67 to 75% [18-19]. PrEP is intended for people at-risk of becoming infected with HIV, for example in the case of couples where one partner is HIV-positive and the other is HIV-negative. In countries with generalized HIV epidemics, voluntary medical male circumcision for HIV-negative male partners in relationships with a positive partner has been shown to reduce the risk of HIV-acquisition in men by between 38% to 66% [20]. Using ART to decrease the chance of HIV transmission, a concept known as treatment as prevention, has also recently been found to be very efficacious, with studies in heterosexual populations showing that adherence to ART is very effective at preventing transmission of HIV to HIV-negative partners [21-23]. Couples-testing with treatment for infected partners in discordant partnerships is also a promising approach. Integrating couples counseling and partner testing into routine clinic and community services can increase the number of couples in which the status of both partners is known and can help identifying sero-discordant couples [24].

*Preventing unintended pregnancies and Safer Conception Options:* Preventing unintended pregnancies among women living with HIV (WLHIV) is a powerful prevention strategy. One study found that even modest reductions in the numbers of pregnancies among WLHIV could avert HIV-positive births at the same rates as the use of ART for PMTCT [25]. One targeted approach to strengthening FP programs is to integrate FP within HIV services. In Kenya, a recent cluster-randomized trial tried to determine whether integrating FP services into HIV care was associated with increased use of more effective contraceptive methods such as sterilization, IUDs, implants, injectables and oral contraceptives. Women seen at integrated sites were significantly more likely to use more effective methods of FP at the end of the study [26]. This makes the case for integrating FP within HIV care. Reducing the unmet need for FP will reduce new HIV infections among children and improve overall maternal and infant health.

For HIV-positive or serodiscordant couples who would like to have children, there are many options available to make conception safer. When offering preconception care, HIV-positive couples will have specific needs, many of which can be addressed during their routine HIV care. When offering preconception counseling for HIV-positive women, the CDC recommends that health care providers should discuss a variety of topics, including:

reproductive options and actively assessing women's pregnancy intentions on an ongoing basis; Counseling on safe sexual practices that prevent HIV transmission to sexual partners, protect women from acquiring sexually transmitted diseases, and reduce the potential to acquire more virulent or resistant strains of HIV; Using ART to attain a stable, maximally suppressed maternal viral load prior to conception to decrease the risk of perinatal transmission and of HIV transmission to an uninfected partner; and encouraging sexual partners to receive counseling and HIV testing and, if infected, to seek appropriate HIV care[11].

For couples who want to conceive, in which one or both are HIV-positive, the positive partner should be on ART and have achieved maximal suppression of HIV infection. ART for the positive partner may not be fully protective against sexual transmission of HIV and so the administration of PrEP for the HIV-negative partner may offer an additional tool to reduce the risk of transmission. For discordant couples, when the positive partner is a woman, the safest conception option is artificial insemination. In discordant couples where the positive partner is male, the safest conception option is the use of donor sperm from an HIV-uninfected male with artificial insemination. When the use of donor sperm is unacceptable, the use of sperm preparation techniques together with either intrauterine insemination or in vitro fertilization is an option [11].

*Preventing HIV transmission from WLHIV to infants:* Increasing access to ART for WLHIV is critical to saving the lives of women and their children. The number of pregnant WLHIV receiving ART for their own health has increased from 25% in 2009 to 60% in 2012 [1]. One of the greatest success stories has been in Malawi where a policy of providing lifelong ART to all pregnant and breastfeeding women (irrespective of CD4 count or clinical status— a strategy referred to as Option B+) was enacted in 2011. Since then, Malawi increased the estimated coverage of women in need of ART from 13% in 2009 to 86% in 2012. The implementation of Option B+ has resulted in a 748% increase in the number of pregnant and breastfeeding women starting ART, from 1,257 in the second quarter of 2011 to 10,663 in the third quarter of 2012 [27]. As a result of Option B+, the perinatal transmission rate for women on ART is expected to be reduced, from approximately 40% without intervention to less than 5%. By decentralizing treatment services and offering lifelong HIV treatment to all pregnant and breastfeeding women, Malawi has been able to increase ART coverage both during pregnancy and the breastfeeding period [1].

*Providing treatment, care and support to WLHIV and their children and families:* Increasing access to ART for pregnant women living with HIV for their own health is critical to saving the lives of women and their children. Even developing countries, which at first lagged behind in reducing the number of children newly infected with HIV, have made great gains in recent years. In 2013, UNAIDS reported that in 7 high burden countries where access to treatment has increased, the rates of HIV transmission to children has fallen by 50% or more [1].

## What still needs to be done?

HIV is a preventable disease. Perinatal transmission is best prevented by effective, accessible and sustainable HIV prevention, access to HIV testing, early diagnosis and linkage to treatment programs for women, men and their children, access to family planning and abortion services to prevent unintended pregnancies, and access to an ongoing supply of ARVs to improve the health of women and their children. Structural interventions are also needed that increase access to health centers, improve health care infrastructure, provide food supplementation, and HIV treatments.

Women are the key to the HIV response and the number of women acquiring HIV has to be reduced. All women have a right to be treated for HIV infection, not simply because they are bearing a child. All women living with HIV who are eligible for ART need to have access to it. Unfortunately, too many women are still lost along the prevention cascade and never get the care or treatment they need and deserve. Providing women with access to high quality healthcare for themselves and their families, whether they are HIV-positive or not, is imperative.

## Says who?

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