

AIDSTAR-One SPOTLIGHT ON PREVENTION

Eliminating Pediatric AIDS: What It Will Take and What It Will Bring

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In the coming decade, the world can look forward to the virtual elimination of new HIV infections among infants. This extraordinary achievement is a result of sustained research successes during the first two decades of the AIDS epidemic, an unprecedented expansion of HIV prevention and treatment programs during the last decade, and increased global attention and leadership in recent years.

Early epidemiologic research has been critical to this victory. Researchers were able to describe the magnitude and distribution of the global pediatric AIDS epidemic, determine that the risk for mother-to-child transmission of HIV is 25 to 40 percent, and identify the primary ways children get infected with HIV: in utero, during labor and delivery, and through breastfeeding (De Cock et al. 2000). Clinical research proved that risk of mother-to-child transmission of HIV could be dramatically reduced with antiretroviral (ARV) drugs that decrease viral load in HIV-positive pregnant women and provide pre- and post-exposure prophylaxis to their infants (Connor et al. 1994; Guay et al. 1999; Shaffer et al. 1999).

Implementation research has demonstrated that facility-based programs utilizing rapid HIV testing that targets ARVs to HIV-positive pregnant women and their newborns could be effectively implemented outside of clinical research settings (Stringer et al. 2003). National

monitoring systems documented the virtual elimination of new HIV infections in children in several countries that have adequate resources and strong health systems (Amornwichee et al. 2002; Lindegren et al. 1999). More recently, World Health Organization (WHO) guidelines released in 2010 helped resolve longstanding questions about how giving HIV prophylaxis to HIV-positive mothers or to their infants can improve the safety of breastfeeding (WHO 2010a).

In response to this steady progress on the research front, donors and governments began mobilizing resources to support a dramatic expansion of prevention of mother-to-child transmission of HIV (PMTCT) programs, extending their reach to women throughout the world. The Elizabeth Glaser Pediatric AIDS Foundation's Call to Action program (Spensley et al. 2009), launched in 1999, was followed by Columbia University's MTCT-Plus Initiative in 2001 (Myera et al. 2005) and the U.S. Government's Mother and Child HIV Prevention Initiative in 2002 (Office of the Press Secretary 2002). Resources and programs then increased dramatically under the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM; Institute of Medicine 2007; Salaam-Blyther 2008).

Through these efforts, substantial progress has been made. Globally, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that half of all HIV-

positive pregnant women received ARVs in 2010, and PEPFAR estimates that 200,000 infant infections were averted in fiscal year 2011 (Office of the Press Secretary 2011; UNAIDS 2011b). Nonetheless, the glass is still only half full—the other half of HIV-positive pregnant women are not on ARVs, programs are still catching up in adopting the most effective PMTCT regimens, and more than 1,000 infants are still infected with HIV each day (UNAIDS 2011b).

A New Global Movement

To address this disparity between scientific and program successes on one hand and ongoing service gaps on the other, a new global movement with aggressive targets to virtually eliminate pediatric AIDS has recently emerged. The combined efforts of key stakeholders led to the development in 2011 of a Global Plan for eliminating new HIV infections in children and the subsequent establishment of a Global Steering Group to mobilize leadership and resources and coordinate activities. The effort is based on a four-pronged approach (see text box): reducing HIV incidence in women by 50 percent, reducing the unmet need for family planning among HIV-positive women to zero, reducing the risk of mother-to-child transmission of HIV to less than 5 percent, and providing antiretroviral therapy (ART) for 90 percent of eligible HIV-positive women (UNAIDS 2011a).

This unprecedented alignment of science, experience, and political support brings hope that the world will soon see a new generation free of HIV infection. Achieving that vision, however, will require significant continued investment in a wide range of essential activities, including optimizing interventions, maximizing coverage and retention, strengthening health systems, engaging communities, assuring adequate human resources, implementing favorable policies, promoting leadership and coordination, mobilizing adequate financial resources, developing research and innovation, and conducting surveillance and measurement.

FOUR-PRONGED APPROACH TO PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV (UNAIDS 2011A)

Prong 1: Prevention of HIV among women of reproductive age within reproductive health services, such as antenatal, postpartum, and postnatal care, and within other health and HIV service delivery points, including community structures.

Prong 2: Provide appropriate counseling and support, as well as contraceptives, to women living with HIV to meet their unmet needs for family planning and spacing of births, and to optimize health outcomes for these women and their children.

Prong 3: For pregnant women living with HIV, ensure HIV testing and counseling and access to the antiretroviral drugs needed to prevent HIV infection from being passed on to their babies during pregnancy, delivery, and breastfeeding.

Prong 4: HIV care, treatment, and support for women, children living with HIV, and their families.

Optimal interventions: Recent research and the new WHO guidelines offer ways to optimize necessary interventions (WHO 2010a). First, recent research has begun to identify new prevention tools that promise to help eliminate HIV in children by preventing infection in their parents, such as voluntary medical male circumcision, treatment as prevention, pre-exposure prophylaxis, and couples testing with treatment for the infected partner in a discordant couple. Second, the guidelines recommend that all women who are eligible for ART should receive it to

maintain their health and to reduce the risk that they will transmit HIV to their infants. Third, the guidelines extend the duration of ARV use for PMTCT from 14 weeks gestation through the end of breastfeeding (12 to 18 months postpartum). Fourth, the guidelines offer a choice of two ARV prophylaxis regimens—option A (maternal zidovudine followed by daily infant nevirapine prophylaxis) or option B (maternal triple ARV prophylaxis)—for HIV-positive pregnant women with CD4 cell counts greater than 350 cells/mm³ who do not need ART for their own health. Finally, in appropriate settings where breastfeeding is important for infant survival, new infant feeding guidelines recommend breastfeeding by HIV-positive mothers and ARV prophylaxis for the mother or infant to minimize

HIV transmission and maximize infant survival (WHO 2010b).

High coverage and retention: While optimizing interventions is critical, models show that achieving the elimination of mother-to-child transmission of HIV will require reaching more than 90 percent of pregnant women with a sequence of PMTCT services (Barker, Mphatswe, and Rollins 2011), which entails women accessing the health system followed by continued retention across multiple encounters, along with community support (Figure 1). The relative importance of such coverage and retention is shown in Figure 2, which uses a model based on actual South African data to illustrate that poor coverage and re-

Figure 1. Sequence of Prevention of Mother-to-Child Transmission of HIV Services in Community and Facilities

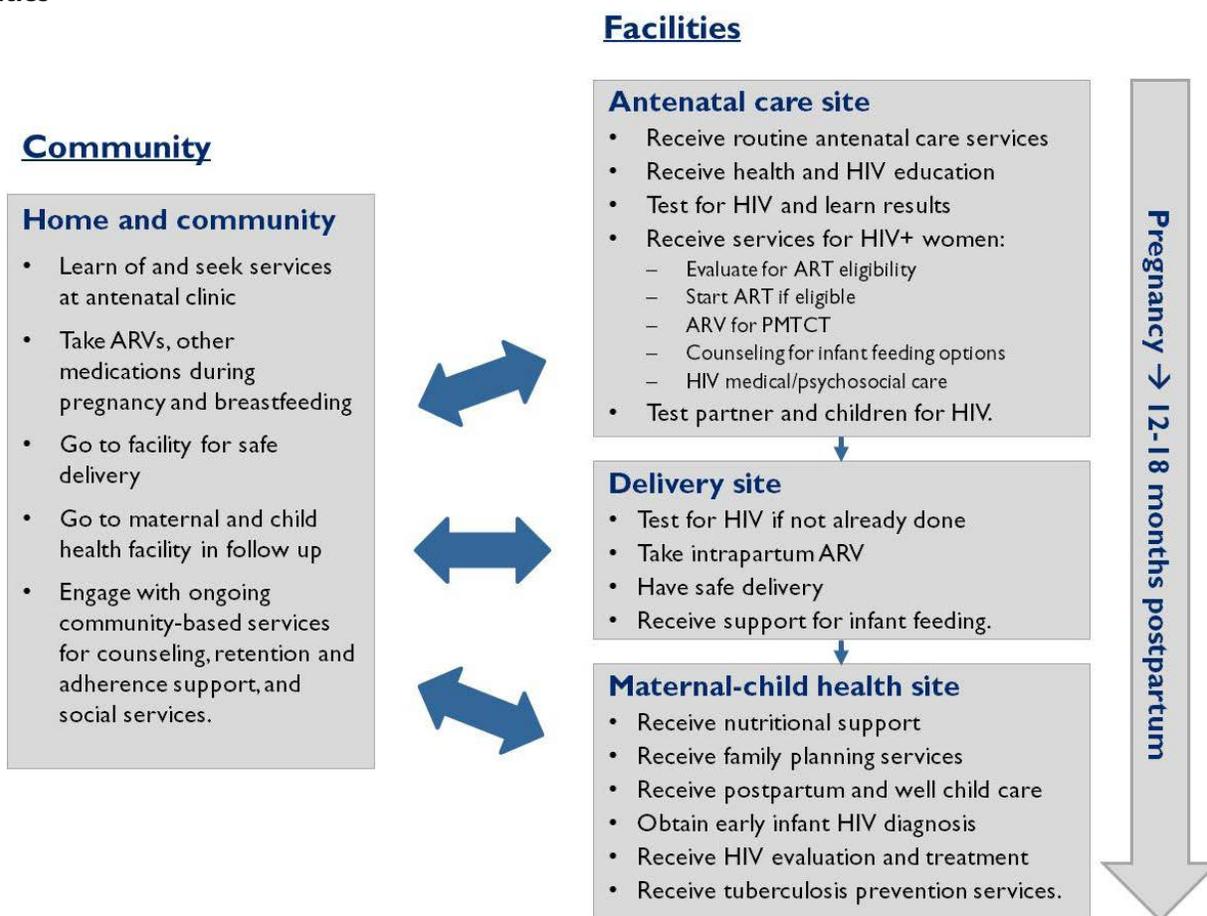
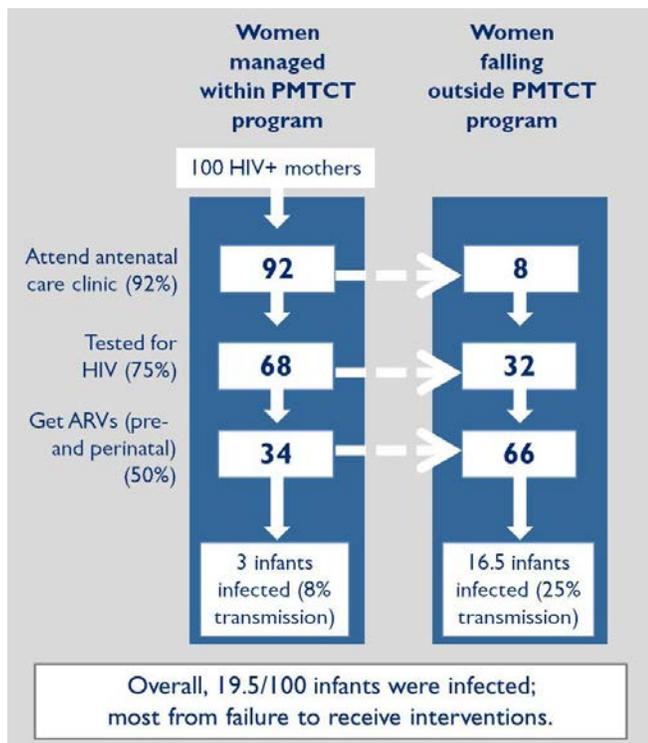


Figure 2. Importance of Uptake and Retention on Prevention of Mother-to-Child Transmission of HIV Outcomes (Barker, Mphatswe, and Rollins 2011)



tention of pregnant women impact transmission more than the specific prophylaxis regimens used (WHO 2010b).

Key barriers to uptake and retention include such factors as distance, competing demands, illness, stigma, unattractive facilities, and disempowerment. Careful analysis will help interventions overcome local service gaps and barriers to coverage and retention.

Strong health systems: Achieving high coverage and retention in PMTCT services will require strong health systems to support integrated, client-centered delivery of PMTCT, ART, and maternal and child health (MCH) services, including the following system components:

- A national plan to eliminate pediatric AIDS that organizes and coordinates a systematic response among all involved stakeholders

- Strong management systems at the national, district, facility, and community levels to carry out the plan
- Financing systems that promote performance toward targets
- Supply chain systems for reliable access to test kits, drugs, and other necessary commodities
- Standard operating procedures for clinic, laboratory, and other services to promote consistent and reliable flow of clients, specimens, and information
- Quality improvement systems to promote both quality and innovation in programs
- Recruitment, retention, and capacity building systems to optimize human resources
- Clean and functional buildings and infrastructure to improve the working environment and attract clients
- Modern information and communication systems to improve patient tracking, resource planning, accountability, data quality, and ability to use data to guide programs.

Engaged communities: Communities must be knowledgeable about HIV transmission and be aware of high-quality PMTCT services in order to demand them. Moreover, communities will be the source of the best ideas for dealing with such challenges as stigma, discrimination, empowerment of women, and reaching male partners who may not come to antenatal clinics or other health services. In addition, critical services such as psychosocial support and HIV testing must be available in communities.

Finally, links between facilities and communities, particularly through the use of peer support structures and community health workers, can help ensure the retention of women and children in the longitudinal services needed for HIV prevention and care. For

instance, involving community counselors in PMTCT service delivery and client follow-up in Côte d'Ivoire led to a significant increase in uptake of PMTCT services, with 100 percent of pregnant women offered HIV testing in antenatal care, compared to 51 percent before placement of community counselors (Elizabeth Glaser Pediatric AIDS Foundation 2011).

Human resources: In many countries, the relative labor intensity of this work requires additional human resources. Developing and implementing programs to expand and retain a trained work force is critical. To maximize the provision of PMTCT interventions, it will be necessary to create new job roles or positions and involve lay workers such as community-based birth attendants. “Task shifting” and “task sharing,” as well as training or retraining for all roles—management, leadership, research, counseling, laboratory staffing, and so on—can facilitate this. For example in Swaziland, a simple one-day targeted training intervention for maternity nurses significantly increased the identification of HIV infection during delivery, including seroincident cases (Kieffer et al. 2011).

Favorable policies: Policies must be in place that encourage and facilitate effective service delivery and the well-functioning systems needed to support it. Policies that support the integration of HIV and MCH services, promote routine HIV testing, and allow the sharing and shifting of tasks to appropriate cadres of health workers will create an environment favorable to the pediatric HIV elimination effort. For instance, policies that reduce unnecessary staff rotations to maintain a trained work force to consistently match skills to duties can support successful outcomes. Advocacy activities at various levels to increase awareness and demonstrate the impact and costs of such proposed policy changes can support needed changes.

Leadership and coordination: Local leadership must mobilize communities and advocate for services, collaborating and coordinating with health facilities to ensure seamless service delivery. Leaders within districts and health facilities must manage the changes

to the service delivery system and facilitate coordination across clinics to streamline client care. Nationally, leadership is needed to commit to improving MCH services, mobilize resources and attention, change unfavorable policies, and strengthen and change health systems.

National leadership can also ensure cooperation across government departments and coordination among implementing partners. Regionally, coordination is needed to ensure that relevant experiences and knowledge can be shared among countries. At the global level, the newly formed Global Steering Group provides leadership and coordinates resource mobilization.

Adequate financial resources: The Global Plan estimates that the global resources needed to meet the pediatric HIV elimination goal in 2011 was U.S.\$900 million, which will increase to U.S.\$1.3 billion by 2015—but currently only U.S.\$500 million is available (Office of the Press Secretary 2011). Resources to fill the gap will need to come from national budgets, multilateral funding mechanisms such as GFATM, bilateral programs such as PEPFAR, and private and corporate donors. Efficient use of limited resources is critical, particularly given the global financial crisis, highlighting the importance of health economics research.

Research and innovation: The U.S. National Institutes of Health, through the International Maternal Pediatric Adolescent AIDS Clinical Trials Group, is conducting a multicountry efficacy trial directly comparing the PMTCT ARV prophylaxis options (option A or option B, mentioned previously), as well as option B+ (maternal ART for life). Meanwhile, countries have begun implementing each of these PMTCT options, providing the unique opportunity to collect feasibility, acceptability, utilization, safety, and effectiveness data in parallel to the clinical trials. Research is also needed to develop cheaper, better, safer, and simpler interventions; identify more effective and efficient ways to implement programs; understand factors that facilitate

or inhibit use of services by women and their infants; monitor the positive and negative impact of programs; and introduce new tools to improve communication, uptake, retention, adherence, drug packaging, and point-of-care testing. Finally, continued research will be required to pursue an effective vaccine, which will ultimately be the most effective means of preventing HIV infection in children and adults.

Surveillance and measurement: Continued improvement in data collection and analysis systems will allow countries to better assess their progress toward achieving the goal of eliminating pediatric HIV. Moreover, as services scale up, measurement issues will change from a focus on counting the number of services delivered and other inputs to a focus on population-based surveillance of service-delivery coverage, and on measuring the impact of programs on reducing HIV infection and increasing HIV-free survival. To support this, approaches such as HIV case surveillance and mortality registries will increase in importance, as will monitoring retention in care and ARV adherence, as well as surveillance for any potential negative effects of the program, such as adverse pregnancy outcomes, drug reactions, or ARV resistance.

Although rare in comparison to mother-to-child transmission of HIV, children have also been infected through other modes of transmission, including transfusion, medical injections, other blood contact, and sexual abuse. The field should remain vigilant to these possible causes and continue efforts to strengthen health care safety and prevent sexual abuse.

The Broader Benefits

Although much is required to achieve elimination of pediatric AIDS, if successful, this effort will bring benefits well beyond the reduction of new HIV infections in children. The full engagement of women in HIV prevention, care, and treatment programs will lead to healthier mothers and fewer orphans. Successful PMTCT programs will further benefit the health of women and all family members by strengthening

MCH programs overall through promoting early and regular antenatal care attendance, expanding supportive peer counseling, extending community outreach, promoting facility-based deliveries, encouraging regular postnatal follow-up for mother and child (including family planning services and immunizations), improving infant feeding education, emphasizing routine growth monitoring, and improving overall family-centered care, including partner participation. The MCH system will become stronger through building human capacity, creating community demand, improving transport and supply chain systems, implementing quality improvement processes, and improving infrastructure to directly enhance the delivery of other health services to women and children; MCH can then serve as a platform for other effective primary care services.

Finally, demonstrating a major success in the fight against AIDS and helping achieve key Millennium Development Goals will provide proof that a sustained, evidence-based effort can be effective in not only addressing a major component of the AIDS epidemic, but also improving the health of mothers and children overall. ■

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