Each year, over half a million newborns are infected with HIV in sub-Saharan Africa through mother-to-child transmission (MTCT). Of all health crises in the African region, HIV/AIDS has attracted the most political support and resources. Programmes for the prevention of mother-to-child transmission (PMTCT) of HIV include antenatal HIV testing and counselling, avoiding unintended pregnancy, provision of appropriate antiretroviral (ARV) regimen for mothers and newborns, and support for safer infant feeding options and practices. However, in spite of efforts to scale up, less than ten percent of pregnant women in Africa infected with HIV receive interventions to reduce MTCT. Even in settings where effective prophylaxis is available to prevent transmission during pregnancy and childbirth, there is often a major gap in service provision in the postnatal period. Few PMTCT programmes successfully reach mothers and newborns after discharge to provide support for the infant feeding choices or to provide ongoing care and treatment.

Most PMTCT interventions focus on identifying HIV-positive mothers and preventing HIV infection in infants. In the same time period maternal, newborn, and child health (MNCH) programmes are aiming to ensure the survival of children from “traditional” causes of death, especially during the high-risk neonatal period. The risk of newborn death in Africa is high; many of these deaths could be prevented by simple measures provided during the postnatal period, which is also an important time for PMTCT follow up.

The goal of HIV-free survival for children highlights the win-win proposition of integrating PMTCT and MNCH. Indeed, the investment in PMTCT will be safeguarded by ensuring that simple interventions are delivered through MNCH services to promote survival. The challenge is determining how integration between PMTCT and MNCH programmes can be achieved in reality.
Problem

The HIV crisis in Africa is headline news. Even in countries where leadership is ambivalent to treating adults, there is often clear commitment to PMTCT of HIV. In Africa, HIV infection rates among pregnant women range from 15 to 40 percent in the countries with the highest overall HIV prevalence, with women of reproductive age comprising over 55 percent of HIV-infected adults. This overwhelming burden is carried by women and babies as well as families, society, and the health system:

Effects on women: HIV is becoming the leading cause of death for women in some African settings. Pregnant women with HIV are at an increased risk of intrapartum and postpartum complications. Emerging evidence suggests that HIV-infected women are more susceptible to postpartum infections and have higher rates of postpartum complications than uninfected women, regardless of whether their babies have a vaginal or caesarean birth. In some southern African countries, maternal mortality due to opportunistic infections is a major cause of maternal death. A study covering 50 years of maternal death in South Africa found that recent increases in maternal mortality are mainly due to an increase in infections associated with HIV/AIDS and not pregnancy-related infections, thus making HIV/AIDS the most frequent cause of maternal death (18 percent) in this setting. In Zambia, the maternal mortality ratio for Lusaka University Teaching Hospital was calculated in 1997 at 921 per 100,000 live births, a significant increase from the 160 noted in 1974 and 667 in 1989. During the same period, causes of maternal death changed with a decline (94 percent to 42 percent) in direct causes and an increase (6 percent to 57 percent) in deaths due to opportunistic infections. In addition to an increased risk of infection, HIV also increases susceptibility to other health problems; for example, women living in impoverished areas are at greater risk of malnutrition if they are HIV-positive.

Effects on newborns: While HIV/AIDS is not a major direct cause of neonatal death, maternal HIV status affects newborn survival by causing an increased risk of stillbirth and death in the neonatal period and infancy, even among those babies who do not become HIV-positive. Newborns of HIV-positive women are more likely to be very low birthweight (LBW), preterm and have low Apgar scores, placing them at greater risk of death. While babies born to all HIV-positive mothers are susceptible to acquiring the infection, women who become infected with HIV during pregnancy or while breastfeeding have an exceptionally high risk of passing the infection to their newborn. The interaction of HIV with other infections and the indirect effects of HIV, such as poverty and maternal illness, also contribute to poor outcomes for newborns. In addition, confusing information about feeding choices for HIV-infected women, combined with the provision of commercial infant formula in poor communities with high infant mortality rates, has resulted in losses for breastfeeding in general and has had a spillover effect on the breastfeeding behaviours of non-HIV-infected mothers and infants as well.

Effects on children: AIDS is an important cause of mortality and morbidity after the first month of life in many African countries. HIV-infected children have a significantly higher risk of death from Pneumocystis jiroveci pneumonia (PCP), and from HIV-related complications, such as failure to thrive. It is estimated that AIDS caused six percent of under-five deaths in sub-Saharan Africa during the year 2000. Yet in six southern African countries, including those which had success in reducing child deaths from other causes prior to the AIDS epidemic, AIDS is now the cause of more than one-third of all under-five deaths: Botswana (54 percent); Lesotho (56 percent); South Africa (57 percent); Namibia (53 percent); Swaziland (47 percent); and Zimbabwe (41 percent). In the absence of any intervention to prevent transmission, as is the case for most African mothers, roughly one-third of all infants born to HIV-positive mothers will acquire the infection. The risk is in stark contrast to high income countries, because transmission rates are less than two percent, there is almost total elimination of paediatric HIV.
**Effects on families and society:** HIV has many indirect effects. For instance, families where parents are ill with AIDS are often impoverished by a lack of employment and high medical bills. Therefore, even for children who escape HIV infection, home care and care seeking are often compromised. When an HIV-infected mother progresses to the late stages of AIDS, her children are 3.5 times more likely to die, irrespective of their infection status, and more than four times as likely to die when the mother herself dies. The loss of parents is an additional detriment to families and a strain on societies. The epidemic has already produced an estimated 12 million orphans on the continent; nine percent of all children will have lost at least one parent due to AIDS, and one in six households with children are caring for orphans.

**Effects on the health system:** The effect of the HIV epidemic on the health sector itself has serious consequences for all. The drain on local health systems of increased workloads as well as the deaths of infected health care providers affects all aspects of health care provision, with newborns especially vulnerable. For example, 15 out of 27 districts in Malawi have fewer than two nurses per facility, a problem that is exacerbated by HIV/AIDS. Only a few African countries, notably Swaziland and Zambia, have programmes to counsel, support, and treat health workers exposed to HIV.

Early identification of HIV-exposed newborns and infected children is especially important because they are at increased risk of life-threatening infections such as PCP, tuberculosis, and nutritional deficiencies. In addition, other infections, such as malaria and diarrhoea, are likely to be more complicated to treat and result in hospitalisation and death among HIV-infected newborns and infants. The complex interactions between HIV and maternal and newborn health and survival are summarised in Box III.7.1.

The remainder of this chapter will provide an overview of the current PMTCT package and current coverage of interventions during pregnancy and the postnatal period. We will present opportunities for integrating the four components of PMTCT programmes with MNCH programmes. Challenges will also be discussed along with practical steps that can be taken to address these challenges.

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**BOX III.7.1 Interactions between HIV and maternal, newborn, and child health and survival**

- **Malaria:** HIV infection in pregnancy increases the prevalence and effect of malaria, the so-called “double trouble”. Malaria and HIV infection are independently associated with increased risk of maternal anaemia, low birthweight (LBW), and fetal growth restriction. Dual infection with malaria and HIV is associated with increased risk of maternal, perinatal, and early infant death as compared to either disease alone. Infants born to women with HIV and malaria infection are almost twice as likely to be born underweight compared to infection by either malaria or HIV alone. (Section III chapter 8)

- **Tuberculosis:** Tuberculosis (TB) in pregnancy is emerging in the context of HIV. HIV and TB infection are independently associated with increased risk of maternal and perinatal mortality; the impact of dual HIV and TB infection is even more severe, resulting in higher risk of preterm birth, LBW, and intrauterine growth retardation. Recent evidence from Durban, South Africa, showed that TB rates have increased among HIV-infected pregnant women, and TB infections have doubled among newborns and young children. The synergistic effect of HIV on TB in pregnancy is clear from the Durban experience: 54 percent of maternal deaths caused by tuberculosis were attributable to HIV infection, and 35 percent of these maternal deaths were associated with stillbirths.

- **Sexually Transmitted Infections:** There is a strong association between HIV and sexually transmitted infections (STI), as an untreated STI can increase the risk of acquisition and transmission of HIV. Of all the STI, syphilis is a major cause of adverse pregnancy outcomes in developing countries. When partnered
with antenatal care, prevention of mother-to-child transmission (PMTCT) programmes offer an opportunity to implement screening programmes for syphilis that are universally recommended but rarely implemented. (Section III chapter 1 and chapter 2)

• Pneumocystis pneumonia: AIDS-related pneumocystis pneumonia increases the risk of LBW, particularly through preterm birth. Preterm birth increases the risks of hypothermia and neonatal infections.

• Nutritional deficiencies: Nutritional deficiencies compound the effects of HIV/AIDS, while HIV/AIDS can lead to nutritional deficiency. Over half of all pregnant women in Africa are anaemic, and HIV infection and malaria in pregnant women increase the risk of maternal anaemia. Anaemia is associated with increased risk of mother-to-child transmission of HIV as well as reduced survival of HIV-infected women and their babies, independent of HIV disease progression and immune insufficiency. Pregnancy and lactation are periods of nutritional stress for all women. Although pregnancy itself has not been shown to cause more rapid disease progression, HIV-positive women, including those who are pregnant or lactating, have a higher risk for poor nutrition. Energy requirements to maintain body weight are likely to increase by approximately ten percent during asymptomatic infection and up to 30 percent during secondary infections. Integration of PMTCT and maternal, newborn, and child health programmes offers an opportunity to promote improved maternal nutrition and dietary counselling as well as reduce and/or treat anaemia. (Section III chapter 2 and chapter 5)

• Neonatal infections: Due to the compromised immune status of HIV-exposed newborns, counselling on clean cord care and infection prevention are important messages for mothers and caregivers. Mothers should be proactive about preventing infections in their newborns, while service providers should be proactive in diagnosing HIV infection among exposed infants, detecting and promptly treating all newborn infections as well as providing prophylactic cotrimoxazole for HIV-infected babies.

Package
A comprehensive PMTCT approach includes the following four components that address MNCH throughout the continuum of care:

Component 1. Preventing HIV infection in women of reproductive age

Component 2. Avoiding unintended pregnancy among HIV-infected women

Component 3. Preventing transmission of HIV from an HIV-infected woman to her infant during pregnancy, labour, childbirth, and breastfeeding through:
• HIV counselling and testing
• Antiretroviral (ART) drugs for prophylaxis
• Antiretroviral therapy (ART) for those who are eligible
• Safer infant feeding practices

Component 4. Providing follow up and care, support, and treatment to HIV-infected women, their infants, and families

Antiretroviral therapy: The new WHO PMTCT guidelines for ARV drug prophylaxis recommend giving HIV-infected pregnant women the drug azidothymidine (AZT) from 28 weeks, combined with single-dose nevirapine at birth to the mother and infant. Ideally, mothers should receive one week of further treatment of AZT and 3TC postnatally in order to reduce the likelihood of developing viral resistance to Nevirapine. These regimens, although very effective in clinical trials, have not been implemented at scale in high HIV-prevalence settings. Experience within routine health systems is therefore lacking, and whether an integrated antenatal and postnatal care package can be successfully crafted to improve availability, sustainability, and adherence to these prophylactic regimens is yet to be learned. The health system linkages required by these new guidelines underscore the importance of integrating PMTCT and MNCH, particularly postnatal care programmes.

Safer feeding practices: The special challenges related to infant feeding by HIV-positive mothers are important considerations and opportunities for strengthening the linkages between PMTCT and MNCH programmes. WHO currently recommends avoidance of all breastfeeding by HIV-positive mothers if replacement feeding from birth is acceptable, feasible, affordable, sustainable, and safe. However, not breastfeeding is associated with increased risks of diarrhoea and pneumonia; therefore, careful individual counselling and ongoing support are needed. Otherwise, exclusive breastfeeding is recommended for the first few months, or until these conditions are in place. Exclusive breastfeeding may result in lower HIV transmission than partial breastfeeding (breast milk plus animal milk or
solid foods). Mixed feeding, whether or not the mother is HIV-positive, is also associated with higher risks of morbidity, hospitalisation, and death.31 (Section III chapter 5)

**Current coverage, progress, and trends**

PMTCT services exist in most African countries, but coverage is limited and utilisation of services varies between and within countries. In 1998, the first pilot projects were initiated to demonstrate the feasibility of PMTCT programmes in high-prevalence countries. In 2004, just ten percent of women were tested for HIV through PMTCT services, and only 8.7 percent of HIV-positive pregnant women received ARV prophylaxis globally. In East and Southern Africa, where these services are most needed, 17 percent of HIV-infected women were identified as such through PMTCT HIV screening, and only 11 percent of the projected total of HIV-infected pregnant women received ARV prophylaxis. In West and Central Africa, the coverage is even lower: only three percent of infected women were identified, and just one percent received ARV prophylaxis (Figure III.7.1). This deficit does not include women who become infected during pregnancy, when women appear especially prone to becoming infected—some reports suggest that in high HIV prevalent settings, up to five percent of pregnant women may become infected. The deficit also does not include women who were tested for HIV in the very early stages of infection, when anti-HIV antibodies are not yet detectable (the window period), and might have been identified only through repeat HIV testing at 36 weeks or later. Thirty-nine sub-Saharan countries have implemented PMTCT programmes, however, only two countries, Botswana and Mauritius, have achieved universal coverage.

HIV-free child survival requires clear strategies for protecting children from all major causes of death, not just HIV infection. In many countries affected by HIV, coverage of care is low at crucial times for both MNCH services and PMTCT programmes. This results in the characteristic cascade of diminishing service utilisation and delivery of interventions at the most crucial time, as shown in Figure III.7.2. Continuity of care for individuals is an additional challenge affecting the quality of both MNCH and PMTCT services. Data from a project in Mozambique illustrate this major constraint to both MNCH and PMTCT.

The high uptake of at least one antenatal care (ANC) visit (69 percent) in sub-Saharan Africa suggests that ANC represents an ideal entry point for PMTCT interventions. By the time of childbirth, however, less than half of women have access to a skilled attendant during childbirth, or give birth in a health facility. Provision and uptake of postnatal services is a weak link in the continuum of care for women and their babies. Most women and their newborns are lost to the health system after childbirth, yet paradoxically immunisation rates for Bacille Calmette-Guérin (BCG) and three doses of diphtheria, pertussis and tetanus (DPT3) remain high (76 and 65 percent respectively), suggesting that families are still within reach of formal health care services.
Some programmes have strengthened the links between maternal and newborn care and PMTCT. In instances where this has occurred, integration seems to be more feasible and effective in the antenatal period rather than the postnatal period, partly because the existing postnatal services are weak and poorly defined. In Tanzania and Malawi (Figure III.7.3), integration of services and an “opt-out” model for HIV testing – where all ANC clients are tested for HIV unless they choose otherwise – has resulted in very high rates of HIV testing and counselling among ANC clients. However, facility births remained far below that of ANC attendance, and postnatal services for mothers and infants were consistently under utilised. As a result, about a quarter of infected women in the Tanzanian project site and over half the women in the Malawi hospital still did not receive single-dose nevirapine, the antiretroviral prophylaxis available in both countries at that time, during labour, and two-thirds of exposed babies did not receive their corresponding dose within 72 hours of birth. The rift between antenatal and postnatal services and the small number of mothers using the services results in missed opportunities for essential newborn care as well as for introducing HIV-exposed infants to comprehensive care plans including prophylaxis for opportunistic infections, careful growth monitoring, and nutritional care.
PMTCT programmes that primarily rely on facility-based approaches may have limited reach, especially in settings where many women give birth at home. Programmes where PMTCT services have been implemented with a home-based approach have seen an increased uptake of single-dose nevirapine through self-administration by mothers and an increased administration of nevirapine to the newborn by the mother herself. One study showed that 85 percent of women took their nevirapine dose at the time of childbirth, 84 percent of women gave nevirapine to their baby, and HIV transmission rate was reduced to 7.5 percent from 19.4 percent.35

A review of the last six years of PMTCT implementation demonstrates progress in a number of areas. The most critical advances have been the increased global awareness of MTCT of HIV and the response of leadership within national governments, as shown in Box III.7.2. In spite of these encouraging signs, resources and local commitment to improve the quality and delivery of services across entire populations has been slow.

**BOX III.7.2 Strong policy responses to the HIV/AIDS crisis**

**Global**
- The United Nations General Assembly’s 26th Special Session (UNGASS) in 2001 focused on HIV/AIDS and committed to reducing the proportion of infants and children infected with HIV by 20 percent by 2005 and 50 percent by 2010.
- The US Presidential Emergency Response in 2003 and other initiatives focused on increasing access to HIV prevention, care, and support services, with a special focus on HIV-infected women, their children, and families.
- The Group of 8 (G8) nations in 2005 renewed and broadened commitments for universal access to HIV prevention, treatment, and support services by 2010, aiming for an AIDS-free generation in Africa.
- The Global Campaign “Unite for Children, Unite against AIDS” launched by UNICEF in 2005 and the Joint United Nations Programme on HIV and AIDS (UNAIDS), and partners calls for 80 percent of HIV-infected pregnant women to have access to ARVs for the prevention of mother-to-child transmission (PMTCT).
- The PMTCT High Level Global Partners Forum in Abuja, Nigeria in December 2005 included representatives of governments, multilateral agencies, civil societies, and development partners. A call was made to eliminate mother-to-child transmission of HIV and achieve the goal of an HIV-free and AIDS-free generation across the globe. Emphasis was on the need to integrate PMTCT into maternal, newborn, and child health services by linking to other health and nutrition programmes.

**National**
- Ministries of Health are developing and implementing PMTCT policies and programmes, including the Global Strategy for Infant and Young Child Feeding36 to promote breastfeeding for mothers who are not infected with HIV and optimal feeding choices for mothers who are HIV-positive.
- Some countries, particularly Botswana, Uganda, and Senegal, have led the way in showing high level commitment to PMTCT.

**Civil society**
- Strong civil society engagement has been a feature in countries that have reversed HIV trends. For example, the involvement of NGOs and churches in Uganda has broadened and strengthened the government’s programme.
- In South Africa, civil society groups have sustained pressure on all quarters to improve access to affordable and effective treatment, including better nutrition. Joint civil society meetings have improved communication and collaboration between private and public health sectors, commerce, and industry, as well as providing a clearer voice for joint lobbying.
Opportunities to integrate PMTCT and MNCH programmes

Protecting newborns from HIV is critical, but keeping them safe from other common neonatal and childhood infections is just as important. Otherwise, babies who are HIV-free still risk death from other preventable conditions. Failure to do so means that while babies may be HIV-free, they may risk death from other preventable conditions. Hence, PMTCT should be provided within the context of MNCH programmes as well as within services for babies and young children, such as the Integrated Management of Childhood Illness (IMCI), rather than as a vertical or parallel service. At a WHO Technical Consultation on the integration of HIV interventions with MNCH services, participants defined this form of integration as follows:

Integration of HIV interventions into maternal, newborn, and child health (MNCH) services involves the reorganization and reorientation of health systems to ensure the delivery of a set of essential interventions for HIV prevention, treatment and care as part of the continuum of care for women, newborns, children, and families.

The essential interventions of PMTCT and maternal and newborn care are depicted within a continuum of care approach in Figure III.7.4. The four components of the PMTCT framework target the same time periods and same clients as the essential MNCH packages and often rely on the same workers. Integration of MNCH and PMTCT and HIV care is essential especially in settings where HIV/AIDS prevalence is high.

Programmatic opportunities along the continuum of care

Before pregnancy. Integration of PMTCT and maternal and newborn care begins before a woman becomes pregnant. It is critically important that young women have access to comprehensive and integrated reproductive health programmes to prevent both HIV infection and unintended pregnancy. Such an integrated programme would include counselling on safer sex practices and partner involvement, prevention of HIV transmission and other sexually transmitted infections (STI), prompt treatment of STIs, voluntary counselling and testing, disclosure to partners, and family planning services. (Section III chapter 1)

During pregnancy and childbirth. Focused ANC and early identification and treatment of maternal complications as well as early identification of maternal HIV status are central to integration. ANC services should incorporate family planning and birth preparedness, using messages specific to HIV-infected mothers. Among other essential interventions discussed in Section III chapter 2, integrated ANC should include detection and treatment of STIs, including syphilis, testing and counseling for HIV (opt out) and disclosure to partners, and counseling on infant feeding, birth preparedness, family planning, and prevention of HIV and STIs (Section III chapter 2). During childbirth, integration should include minimal invasive procedures, use of the partograph, emergency obstetric care, universal infection precautions, and clean childbirth, active management of the third stage of labor, and counseling and testing for HIV (if not done earlier).

During the postnatal period. It is extremely important to ensure good care for the mother and newborn and continued PMTCT during this time period. HIV counselling within PMTCT programmes is currently focused largely on the test result, with limited discussion about follow up care, reproductive health, prevention of HIV infection, and family planning. Early and regular follow up of infants can improve adherence to either exclusive breastfeeding or replacement feeding and provide the opportunity to monitor nutritional status and growth (growth faltering is an early sign of HIV infection when other causes have been ruled out). Such follow up also can ensure immunisations and cotrimoxazole prophylaxis and facilitate referrals for prompt management and treatment of illnesses. Infection may also be reduced by improving breastfeeding techniques to decrease risks of breast inflammation and other

![Figure III.7.4 Integrating the four components of prevention of mother-to-child transmission programmes with maternal, newborn, and child care along the continuum of care](image-url)
Newborn care can and must be linked with improved PMTCT follow up. Danger signs for newborn infections typically manifest themselves within 72 hours of birth. Newborns who have been born at home can be checked for signs of illness when they are brought back to the health facility within 72 hours for nevirapine (ARV) prophylaxis. This visit also provides an opportunity for the newborn to be given his/her first immunisation and for the caregiver to be counselled on newborn care at home. Just as ANC is an entry point for PMTCT, the delivery of BCG immunisation allows postnatal care to be delivered to both HIV-exposed and non-exposed newborns and their mothers. Routine HIV testing of babies at immunisation clinics could offer a second chance for mothers to learn about their own status and determine if PMTCT interventions have been successful. The mothers of babies who are found to be HIV-infected at this time can be advised to continue breastfeeding, while the knowledge that infants are uninfected can be a strong motivating influence for mothers to optimise feeding practices, whether exclusively breastfeeding or providing replacement feeds with no mixing of the two methods. Thus, the postnatal period provides an opportunity for synergy between PMTCT and MNCH services and also links newborns and infants to child health services and paediatric AIDS programmes.

While opportunities exist for PMTCT throughout the lifecycle, there are also opportunities for strengthening care throughout the various levels of service delivery. In order to understand the extent to which PMTCT and MNCH services are integrated, WHO conducted a needs assessment in Uganda and Mozambique in 2004 aimed at identifying and addressing barriers to integration. The assessment found many gaps in the continuum of care (Box III.7.3).

**BOX III.7.3** Integration of prevention of mother-to-child transmission (PMTCT) and maternal, newborn, and child health (MNCH) services in Uganda and Mozambique: Findings from a WHO baseline assessment

**National level:**

- Policies promote integration in theory. However, operational tools, such as protocols and training, function separately, resulting in weak coordination of services.
- No formal procedures articulated at the national level for following up postpartum women exist.
- No standard procedures for providing family planning services to HIV-positive women exist.

**Health facility level:**

- PMTCT programmes utilise maternal health programmes as a platform by offering PMTCT services in antenatal care (ANC) clinics, in hospitals during childbirth, and at the facility or at home during postnatal care. These programmes primarily emphasise counselling, HIV testing, and the provision of antiretroviral (ARV) medication. These services are often vertically implemented and do not address overall maternal, newborn, and child health and survival or primary prevention for women testing negative.
- Maternal and reproductive health services are not as well funded as PMTCT. Despite evidence of the interaction between HIV, pregnancy, and maternal and newborn complications such as malaria in pregnancy, syphilis, anaemia, and malnutrition, PMTCT funds are not used to strengthen health systems so that other MNCH health programmes also benefit.

**Community level:**

- There is neither a follow up system nor a referral and feedback system after the birth of a baby. As a result, there is no mechanism in place to identify HIV-exposed newborns in order to provide them with special care, including cotrimoxazole, early diagnosis and access to ARV, or support of infant feeding practices.

**Crosscutting:**

- Health worker training does not address integrated service delivery and therefore does not address the possibility of integration.
- Infrastructure does not accommodate integration, therefore reducing its chances.
Lessons learned

• Develop policy and operational guidance for linkages with family planning and postnatal follow up of mothers and newborns and develop referral systems and monitoring cards. Guidance should include explicit operational direction to district management on integrated programme delivery.

• Incorporate indicators for newborn in PMTCT-related data collection.

• Improve access to antiretroviral therapy, care, and support for mothers.

• Use scale up of PMTCT interventions as an entry point for an integrated package of HIV prevention, care, support, and treatment in the post-partum and neonatal period.

Source: Adapted from reference 39

Challenges to integrating PMTCT and newborn care

Obstacles to effective PMTCT programming include inadequate human capacity, limited infrastructure, and poor programme management and coordination. This is compounded by a narrow focus for preventing vertical transmission (Component 3), with limited attention to primary prevention, family planning, ongoing infant feeding support, follow up care, support and treatment of mothers and their babies, and community, family, and partner involvement strategies. One of the major limitations to current PMTCT practice is that it is primarily provided in clinics and hospitals, and these services do not reach the large numbers of women and newborns in rural areas or births that occur at home, which constitute the majority of births. Home visits for ANC and home-based essential newborn care using community approaches provide an opportunity for reaching these mothers and babies. Community networks can be mobilised to provide a vehicle for increasing utilisation of ANC, encouraging women to give birth in facilities, as well as home-based follow up care and support of the mother and newborn. Experience from various community projects indicates that where skilled attendants are not available, there are roles for community health workers in promoting the health facility or even in administering ARVs.

One of the greatest programmatic challenges to PMTCT service delivery and integration is the provision of high quality counselling about infant feeding options to reduce postnatal transmission and support for mothers’ choices after childbirth. As interventions to reduce peripartum transmission of HIV become more effective and accessible, transmission of HIV through breastfeeding will become proportionally more significant as a route of HIV transmission and may eventually account for the majority of all MTCT. Infant feeding practices, however, are influenced by many different factors, not all of which are within the control of the mother, and even fewer of which are within the control of health service providers. However, PMTCT programmes can reduce the virological risk factors for transmission through breastfeeding by improving the health of mothers. Rapid and effective referrals between PMTCT and ARV programmes will enable pregnant women with low CD4 counts to start antiretroviral therapy, which will reduce peripartum transmission and likely postnatal transmission as well. Well-informed and balanced counselling is needed to help women understand the biological and social consequences of different infant feeding practices and the feasibility of implementing such practices safely. Consistent and accurate support should be offered throughout health services to assist both infected and uninfected mothers in maintaining their feeding choice, particularly exclusive breastfeeding or replacement feeding among HIV-infected women. Similar challenges arise when assisting HIV-infected mothers to stop breastfeeding safely and provide adequate nutrition to promote the optimal growth and development of their children.

Successful PMTCT programmes in Africa that have accelerated progress share certain characteristics and solutions for overcoming challenges, ranging from policy revision to the achievement of high coverage of interventions (Box III.7.4). These characteristics are remarkably similar to the lessons learned from countries that have made progress in reducing neonatal mortality as outlined in Section IV.
As shown in the examples from Zambia and Zimbabwe, political commitment and sound programme management through provision of simple tools, job aids, and health information registers can facilitate better integration of programmes. Some practical steps can be taken:

- **Policy**: Formalisation of health service policies and service delivery to include essential MNCH as well as PMTCT, with a specific review of policies for ANC and PNC.
- **Programmes and supplies**: Harmonisation of protocols and revision of pre-service education and in-service training for a more integrated curriculum and service delivery approach (e.g. PMTCT interventions should link with ANC protocols malaria and STI management, anaemia prevention and control, and nutrition care). Also needed are postnatal follow up protocols that promote routine PNC with growth monitoring, infant feeding counselling and support, infection detection, and treatment with cotrimoxazole. The linking of supply logistics could also be of mutual benefit. For example, HIV testing kits tend to be effectively supplied in many countries, but syphilis tests are often unavailable – linking syphilis testing supplies to HIV testing logistics systems may be a key opportunity to improve coverage.
- **Planning**: Development of district implementation plans and training of district managers and coordinators on how to integrate policies and protocols into district operations.
- **Implementation**: Development and/or revision of integrated programme implementation tools and job aids. These include safe motherhood registers, maternity counselling job aids, birth preparedness plans, and health information and health management cards for mothers and children, which have information on PMTCT services. For example, in both Zambia and Zimbabwe, community mobilisers were used to promote newborn care, PMTCT, and community support for safer infant feeding.
- **Monitoring and evaluation**: Better use of monitoring indicators to improve quality and coverage.

Boxes III.7.5 and III.7.6 illustrate how two countries have followed many of these practical steps and developed and/or adapted job aids and other tools for national use.

**BOX III.7.5 Integrating HIV-related information with maternal, newborn, and child health (MNCH): The Zimbabwe experience**

**Programme**

Zimbabwe declared prevention of mother-to-child transmission (PMTCT) a national priority in 2001 and embarked on the rapid scale up of PMTCT programmes across the country. It quickly became apparent that to achieve rapid and sustainable scale up of PMTCT services, it was necessary to adapt existing tools as well as monitoring and record keeping systems used at Ministry of Health and Child Welfare (MOHCW) services to ensure the inclusion of information across the spectrum of antenatal, intrapartum, and postnatal services. Of particular concern was the ability to manage
the ongoing care and follow up of HIV-infected mothers and their HIV-exposed babies. The MOHCW concluded that the integration of PMTCT interventions with existing MNCH services was urgently required at all levels of the health delivery system in order to provide a continuum of care for HIV-infected women and infants whenever and wherever they may go. Several tools were modified to include PMTCT information, including the antenatal booking register and birth register, the mother’s card, and child health card. Revisions in the child card included updates on Integrated Management of Childhood Illness (IMCI), immunisation, growth, nutrition and infant feeding messages, male-friendly graphics, and the identification, care, and diagnosis of HIV-exposed infants as well as additional prompts for health workers. Revisions in the mother’s card included counselling and testing for HIV of both mother and partner, space to record disclosure status of mother, counselling checklist, family planning, psycho-social and nutritional support, and ongoing HIV care. In 2002, these tools were put in place and accompanied by training in the use and dissemination of a standardised national PMTCT procedures and logistics manual.

Key lessons learned:

• A health system-based approach coordinated by the Ministry of Health is required to scale up HIV/AIDS services nationwide.

• The process of updating MNCH tools strengthens the quality of services because it presents an opportunity to provide technical updates and increases communication across sectors and the community to the national level.

• The tools strengthen MNCH service delivery by assisting health workers to provide integrated care at the service delivery interface for all individuals, including those who are HIV-infected/exposed.

• Hand held record cards for mothers are important tools for integrating MNCH and PMTCT services.

Source: Adapted from reference42

BOX III.7.6 Integrated maternal, newborn, and child health (MNCH) and prevention of mother-to-child transmission (PMTCT) programme in Zambia

Programme

Linkage and integration with maternal, neonatal, and child health are the hallmarks of the Zambian national PMTCT programme. The goals of the Zambian National PMTCT strategic framework include improvement in child survival and development through the reduction of HIV related infant and childhood morbidity and mortality, as well as a decrease in maternal mortality through the strengthening of antenatal, childbirth, and postnatal care services. The Reproductive Health Unit of the Central Board of Health coordinates and harmonises all partners’ activities, integrates PMTCT into MNCH services, and links these programmes to youth-friendly services as well as Tuberculosis and HIV/AIDS programmes. Today, PMTCT services are integrated in all 72 districts. PMTCT has strengthened the safe motherhood programme by utilising PMTCT funds to support systems for safe motherhood services such as the provision of tetanus toxoid immunisation, malaria and anaemia prophylaxis, postnatal care (PNC), and family planning. The staff at different service delivery points have been oriented to provide information and refer clients across services, and integrated tools and job aids have been developed and demonstrated to staff, including the safe motherhood register, maternity counselling job aids, mother’s birth preparedness cards, mother’s cards, and child’s cards. The integrated antenatal and postnatal registers record indicates when women should be followed up for infant feeding counselling and checking the infant’s HIV status. This targeted approach has allowed some facilities to initiate 6 and 18 month follow up, despite being short-staffed. The programme is
also utilising traditional birth attendants who have been trained in essential newborn care in two peri-urban districts. The traditional birth attendants promote PNC by encouraging women to visit health facilities within 72 hours after childbirth and through breastfeeding support groups.

**Key Lessons Learned**

- Integration of PMTCT in reproductive health programmes, including safe motherhood, family planning, adolescent reproductive health, and child health is feasible, and follow up of babies is possible, even with staffing constraints.

- Community participation and male involvement are crucial in supporting women who choose not to breastfeed and in facilitating access to paediatric follow up, care, and support.

- Scaling up from pilot projects to national programmes has not been easy since the pilot sites were carrying out vertical programmes that focused on Component 3 only (time of birth), while the national PMTCT programme integrated all four components of PMTCT into reproductive health, in particular adolescent health, family planning, safe motherhood, and community programmes for care and support.

**Sources:** Adapted from references

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**Conclusion**

PMTCT programmes have received widespread global support and have contributed to innovative solutions for delivering complex interventions in resource-limited settings. Yet coverage continues to be low with only one in twenty mother-baby pairs being treated with ARVs. Investing millions to prevent HIV infection in babies makes little sense if the baby dies in the first weeks of life from pneumonia or another highly preventable cause of death. Identifying and strengthening weak or missing links between PMTCT and MNCH programmes will increase the likelihood of meeting the basic health needs of mothers and newborns in this high risk time period just around birth. PMTCT programmes provide an opportunity to strengthen MNCH including newborn care using a holistic approach that prevents HIV infection and enhances maternal, newborn, and child health – working towards the goal of HIV-free survival.
Priority actions for integrating MNCH and PMTCT

• Policies: Review policies, especially those related to the antenatal and postnatal periods and integrate MNCH with PMTCT.

• Programmes and supplies: Develop an integrated curriculum, service delivery approach, and supply logistics system.

• Planning: Develop joint district implementation plans and train district managers and coordinators on how to integrate policies and protocols and logistics within district operations.

• Implementation: Develop or revise integrated programme implementation and monitoring tools and job aids.

• Monitoring and evaluation: Make better use of monitoring indicators to improve the quality and coverage of both MNCH and PMTCT and to advocate for more support.