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INTEGRATING PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV INTERVENTIONS WITH MATERNAL, NEWBORN, AND CHILD HEALTH SERVICES

TECHNICAL BRIEF

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BACKGROUND

In developing countries, the continuing HIV pandemic constitutes an increasing risk to pregnant women, their infants, and their families. Many governments are responding by seeking policies and strategies to increase access to and quality of maternal and child health services as a way to enhance the health of women and children, reduce maternal and infant mortality and morbidity, and improve pregnancy outcomes.

One of these strategies is the integration of two services traditionally provided separately: maternal, newborn, and child health (MNCH) and prevention of mother-to-child transmission (PMTCT) of HIV (see Box I). Guidelines issued by the World Health Organization (WHO) on HIV prevention and care and on infant feeding emphasize incorporating PMTCT over time within MNCH services to ensure appropriate follow-

BOX I. COMPREHENSIVE PMTCT

PMTCT is a clinical approach for preventing the transmission of HIV from an infected mother to her child. Research has shown that PMTCT interventions can reduce the risk of HIV transmission from mother to child from about 40 percent to less than 5 percent. A PMTCT model developed by the Joint U.N. Programme on HIV/AIDS outlines four steps for comprehensive HIV prevention, testing, treatment, and care for women, their infants, and their families:

1. Primary prevention of HIV among women of childbearing age.
2. Preventing unintended pregnancy among women living with HIV.
3. Providing HIV testing and counseling to pregnant women and giving antiretroviral (ARV) drugs to mothers living with HIV and their infants throughout the maternal period—during antenatal care, labor and delivery, postpartum care, and breastfeeding. This also includes community outreach and efforts to support partner involvement and testing.
4. Supporting HIV-infected mothers and their families.

(WHO 2010b)

up and therapeutic adherence (WHO 2009a; WHO 2010a). Integration in this case entails reorienting health systems to ensure that critical interventions to prevent, detect, and treat HIV are incorporated within the package of services for pregnant women, their infants and children, and their families (WHO 2006b). The vision for full integration calls for inclusion of PMTCT interventions within the full continuum of existing public, private, and community-based women's, newborns', and children's health services, including sexual and reproductive health programs. From a programmatic point of view, integration could also mean merging existing PMTCT and MNCH programs at the district, regional, and national levels.

Integrating PMTCT and MNCH is a complex and lengthy process, entailing coordinated interventions and activities at multiple levels of the health system—from the level of the community and provider to that of the policymaker. PMTCT/MNCH integration is a work in progress that is just beginning in some countries and fully implemented in others, but it is still in need of rigorous study to determine benefits and identify the most promising models. This technical brief provides an overview of the practical and policy components of integration, including: 1) an outline of the clinical considerations of integrating PMTCT and MNCH; 2) a description of strategies for developing policies that support integration of HIV services within the continuum of maternal care; 3) details about some of the particular challenges of PMTCT/MNCH integration; and 4) a list of selected resources that are available online.

CLINICAL CONSIDERATIONS FOR INTEGRATION

Integrated MNCH and PMTCT interventions offer many opportunities to link HIV services across a continuum of care. Integration may increase demand for HIV services and can potentially provide an earlier opportunity for women and newborns

WHY INTEGRATE PMTCT AND MNCH?

The rationale for integrating PMTCT interventions with MNCH services include the high burden and risk of HIV infection among women and girls; the increase in pediatric HIV as a result of mother-to-child transmission (MTCT); the importance of implementing and supporting interventions to prevent or reduce MTCT of HIV during the first one to two years of an infant's and child's life; and the inherent biological and clinical relationships between HIV and sexual and reproductive health. The following are some reasons to consider integrating PMTCT and MNCH:

—The problem is urgent. As of 2008, nearly 47 percent of people living with HIV (15.7 million) were women, and 6 percent (2.1 million) were children (WHO 2010d). Almost all (90 percent) of new infections in infants occur through MTCT (WHO 2010d). Globally, and especially in low-income countries, HIV and maternal complications are the leading causes of mortality among women aged 20 to 59 (WHO 2009b).

—Integration can help to address maternal HIV. Studies have shown that integrating PMTCT interventions with MNCH services create a number of important synergies (Caldwell and Caldwell 2002; Israel and Kroeger 2003). Integration may offer new ways to utilize scarce financial and human resources. Evidence shows that integration may result in increased efficiency of service provision, savings in service delivery expenditures, and improved quality of care for clients through provision of more cohesive services (Lule 2004).

—Integrating HIV services with MNCH services can improve access to care. Integration can enhance access by offering a range of services, including HIV testing and treatment, in one place and during a single visit. Many existing MNCH services (e.g., immunization) are well attended and have high penetration within the target communities. Adding activities to prevent, detect, and treat HIV through safe settings for mothers, reproductive health, and children under-five may increase access to HIV testing, uptake of antiretroviral therapy (ART), and adherence to treatment (Management Sciences for Health 1998). An integrated approach that encourages male sexual partners to support both PMTCT and good pregnancy outcomes may also increase demand for HIV services.

—Integrating PMTCT and MNCH supports the human rights of women living with HIV and their families. Ensuring that mothers living with HIV receive high-quality maternal care was a specific goal of the 2001 U.N. General Assembly Special Session, contributes to progress on several Millennium Development goals, and supports a range of internationally accepted human rights—including rights to life, health, and the choice to marry and have a family.

—Governments and the international community strongly support integration. Governments in many developing countries have developed or implemented policies to integrate PMTCT and MNCH services. Funding from donors—such as the \$63 million Global Health Initiative announced in 2009 by the Obama administration—cites integration of HIV services within reproductive health and maternal and child health as a central priority (Population Action International 2010).

In short, integration of PMTCT with MNCH can address critical gaps in services for HIV and MNCH, and can help to meet the growing demand for these services in a way that is more accessible, acceptable, and affordable to clients and their families (Caldwell and Caldwell 2002). Ultimately, integrated PMTCT/MCNH programs can be the basis for family-centered longitudinal care that can benefit communities and, over time, the larger society.

infected with HIV to initiate ART. The service linkages created through integration should facilitate long-term treatment for HIV, and may decrease loss to follow-up for women who require treatment. Women living with HIV, identified through integrated services, can provide an entry point for testing and counseling others in the family, potentially increasing

testing rates and follow-up care for male partners and other children (WHO and the U.N. Children's Fund [UNICEF] 2009).

Realizing the opportunities and benefits of integration requires action at the policy level (through strategies and guidelines) and at the facility

and provider level (through clinical care). This section describes general principles for integration and suggests specific approaches for integrating PMTCT and MNCH at the clinical level.

GENERAL PRINCIPLES

Introduce Minimum Package of Essential Care for Integration

UNICEF, U.N. Population Fund, the World Bank, and other members of WHO's Partnership for Maternal, Newborn, and Child Health (PMNCH) established a set of essential packages of HIV prevention, treatment, and care throughout the range of MNCH services. The PMNCH established set of essential packages recommends that program managers implement these evidence-based packages within services for family planning, safe abortion care, and MNCH care. These packages can be adapted for any type of facility, from community-based care to referral facilities and hospitals. These interventions form the foundation for country adaptation of a minimum integrated essential care package (WHO 2010a).

Provide Opportunities for HIV Testing, Counseling, and Treatment at Many Venues

Integrating HIV services within existing, well-known venues can increase access to and uptake of PMTCT and HIV services. An evaluation of PMTCT programs in 11 countries showed that between 65 and 83 percent of women who were offered an HIV test after counseling chose to accept the test (Rutenberg et al. 2003). Another study showed that an intervention to integrate ART within antenatal care (ANC) doubled the proportion of eligible women who began ART while pregnant, compared to a nonintegrated ANC program (Killam et al. 2010). The delivery of community-based integrated MNCH packages has been shown to result in significant reductions in neonatal mortality, stillbirths, and perinatal mortality, as well as reductions in maternal morbidity, increased referrals to health facilities, and improved breastfeeding (Lassi, Haider, and Bhutta 2010).

Elicit Community Involvement

Community awareness, acceptance, involvement, and participation are essential to the integration process and for assuring a continuum of care through the various levels of the health system. Community leaders and members, including women, male partners, organizations, and providers, must have input into the integration strategy. Dialogue, careful planning, strong coordination, and solid linkages between the formal health system and the community are essential to a successful strategy.

Expand Communication on Primary Prevention

PMTCT communication strategies offer multiple opportunities to deliver messages about preventing HIV infection and maximizing the health of those living with HIV. PMTCT communication must be carefully planned to meet a complex set of goals, including improving counseling about HIV testing, encouraging early ANC, increasing treatment adherence, and promoting partner and family testing, among others (Pan American Health Organization/WHO, UNICEF, and Censida-Mexico 2002). PMTCT communication must stress **primary** prevention for women of reproductive age not living with HIV, their partners, children, other family members, and communities. Program planners should consider cultural beliefs, behaviors, and norms when developing health packages and counseling messages.

Establish Collaborative and Coordinated Public-Private Partnerships

The public-private partnership is critical for reinforcing the integration of PMTCT within MNCH. The private sector provides a significant portion of care in resource-poor countries: approximately 21 percent of patients receiving ART in six sub-Saharan African nations (Botswana, Kenya, Namibia, Nigeria, South Africa, and Uganda) were receiving treatment in the private sector (Feeley, Connelly, and Rosen 2007). Yet private providers are often left out of

training and policy development. Building capacity among private sector providers and developing strong linkages between the public and private sectors promises increased access to integrated PMTCT programming. Also, integrating private providers into public health information systems and monitoring and evaluation may enhance quality assurance efforts.

INTEGRATING CLINICAL PRACTICES

Integrated Prevention of Mother-to-Child-Transmission and Reproductive Health

The integration of PMTCT into maternal and newborn care can begin before a woman becomes pregnant (WHO 2005). Young women need access to comprehensive and integrated reproductive health programs to prevent both unintended pregnancy and sexually transmitted infections (STIs), including HIV (Fawcus, van Coeverden de Groot, and Isaacs 2005). Preventing unintended pregnancy among women who are already living with HIV is a particularly urgent—and neglected—cornerstone of PMTCT.

Program managers should ensure that health care providers introduce women in reproductive health settings to counseling and support to encourage safer sex practices; prevention, screening, and treatment for STIs and HIV; disclosure to partners; and use of family planning services (Manzi et al. 2005).

Integrated Antenatal Care to Prevent Mother-to-Child-Transmission

ANC is a central component of health care for women of childbearing age, and for many women is the primary entry point into the health care system. Bringing PMTCT and ANC services together increases women's ability to care for themselves and their children and enhances the likelihood of positive pregnancy outcomes (Black et al. 2010). Specific PMTCT interventions during ANC include the following:

- *Improving access to and use of skilled delivery care.* Providers should encourage women to deliver at health facilities where this is possible and at a minimum, establish a birth plan that considers transportation for complicated delivery and involvement of partners or families. In low-income communities, programs might consider subsidized services to increase women's use of skilled care services. In Haiti, such a scheme led to multiple benefits, including the following: use of antenatal services and postpartum service increased; the proportion of women receiving HIV testing nearly doubled; and more women reported involvement of a traditional birth attendant from pregnancy through the postpartum period (Guillaume et al. 2008). Increasing women's use of skilled care at birth may also facilitate the integration of PMTCT into other maternal and child services, such as postpartum and well-baby care (Perez et al. 2008).
- *Introducing HIV and PMTCT topics into routine health education.* ANC health messages, whether delivered individually or to a group of women in a waiting room, are an opportunity to educate clients about HIV and PMTCT. Like other health messages, an HIV-related health education talk can include audiovisuals or other teaching aids (Mazia et al. 2009).
- *Offering provider-initiated testing and counseling (PITC).* HIV testing is an essential entry point for PMTCT. It also offers an opportunity for women not living with HIV to gain the knowledge and skills they need to remain uninfected. Evidence shows that rapid testing (including PITC) is associated with high proportions of clients seeking results (WHO 2003). Some facilities also offer a second test that can be given either at the 36th week of pregnancy or during labor, which addresses testing needs for women who delay attending services until very late in pregnancy or until delivery (Velooso et al. 2002). Where HIV testing is a standard part

of ANC screening tests, clients must be informed of their right to accept or refuse HIV testing.

- *Providing psychosocial support.* Women living with HIV often worry about confidentiality, the baby's health, and their own health (WHO 2003). It is important to address these concerns and provide support to help women overcome daily challenges. Mother-to-mother support groups are one way of addressing this need, as group members can offer psychosocial, treatment adherence, and disclosure support to each other.
- *Testing to determine eligibility for ARV treatment.* Mothers living with HIV should receive CD4 testing to determine their eligibility for ART. Women who do not require or have access to treatment should be offered alternative prophylaxis as outlined in the most recent WHO guidance (WHO 2010a).
- *Providing infant feeding counseling.* Evidence shows that ARVs delivered to the mother, baby, or both can reduce the risk of HIV transmission through breastfeeding (WHO 2010b). WHO recommends that a mother living with HIV whose infant is not living with HIV or is of unknown HIV status should proceed with one of two options for feeding her baby, depending on national policy—exclusive breastfeeding or exclusive replacement feeding (see Box 2).
- *Exclusive breastfeeding* is recommended from zero up to six months together with ARVs for mother or infant and continued breastfeeding and ARVs for one year (WHO 2010b). When both mother and infant are living with HIV, breastfeeding should continue for two years and beyond.
- *Exclusive replacement feeding* using industrially produced infant formula is recommended if the national policy is replacement feeding **or** if the mother opts out of exclusive breastfeeding. The replacement feeding option includes provision of ARVs for

BOX 2. NEW WHO INFANT FEEDING GUIDELINES

The 2010 WHO guidelines for infant feeding recommend that national authorities decide on the best infant feeding practices for mothers living with HIV or infants exposed to HIV and promote that practice specifically. The guidance gives examples of how to handle a range of situations. For example, if national policy promotes breastfeeding and ARVs but ARVs are not yet available, the woman should be instructed to breastfeed exclusively for the first six months and beyond, unless safe replacement feeding becomes available after six months (WHO 2010b).

the mother and the infant (the latter for six weeks after delivery; WHO 2010b).

- *Enhancing male participation.* Involving partners in maternity care through couples counseling, individual counseling, or other measures is often challenging and must be carefully thought out to ensure that the effects are positive. However, men's involvement can make a significant difference in the health of women and their families (Rutenberg et al. 2002). Integrated programs can promote male involvement by addressing community-wide beliefs and norms that often limit such involvement. Women attending ANC and family support groups should be urged to invite their male partners; alternatively, they might invite partners to other educational venues, such as health talks or community dramas.
- *Providing family planning counseling.* Women should receive counseling on healthy timing and spacing of pregnancy to safeguard their health during a subsequent pregnancy. Women who do not want to conceive should be offered effective, safe, and accessible contraceptive options—preferably methods that are readily available at all service delivery sites (for both men and women).
- *Providing health care for the expectant mother.* Program managers may need to amend their es-

sential package of maternal health interventions to ensure that they include a full range of services. Depending on the local context, these could include messages about safer sex; early management of endemic diseases and opportunistic infections; support for women not living with HIV; and testing, counseling, and treatment for STIs.

Integrated Care during Labor and Delivery

For a variety of reasons, women living with HIV are more vulnerable to delivery complications such as anemia and hemorrhage. These women may also receive lower-quality treatment because providers lack the skills to address the needs of mothers living with HIV. Also, many deliveries occur at home or in health facilities that are unprepared to provide basic and comprehensive emergency obstetric-newborn care. These and other factors increase the risk not only of morbidity and mortality for the mother and newborn, but also of transmission of HIV to the infant. Without interventions to prevent MTCT, the risk of transmission is 10 to 20 percent during labor and delivery.

A package of counseling and prevention interventions can enhance quality of care for pregnant women living with HIV—for example, following WHO recommendations for cotrimoxazole and ARV prophylaxis to reduce the risk of MTCT (WHO 2010a). PITC or “opt-out” testing in labor and delivery wards normalizes HIV testing and counseling as part of routine care, and may increase uptake of testing and initiation on ARVs (WHO 2007). Women living with HIV in the labor ward should receive information about danger signs to look for at home, treatment adherence, early infant diagnosis (EID) counseling, nutrition and infant feeding support, options for family planning, and messages about partner and family testing and disclosure support (Tene 2008). Finally, each woman should be linked to community support and postnatal follow-up for herself and the baby (Tene 2008).

Integrated Care during the Postpartum Period

Most maternal and newborn deaths occur in the first week after birth, particularly in the first 72 hours after birth (Lawn et al. 2005). A WHO/UNICEF joint statement recommends providing home-based care and treatment, which can reduce loss-to-follow-up rates, increase adherence to ART, and improve referrals during the immediate postpartum period (WHO and UNICEF 2009). Early identification and follow-up of mothers living with HIV and infants can set the stage for EID, generally done at six weeks of age, and can provide other opportunities for family planning and newborn follow-up care, which, in turn, may improve adherence to proper breastfeeding and facilitate monitoring of the baby’s nutritional status and growth (Embree et al. 2000). Studies testing integrated care in settings with a high rate of HIV document a broad range of potential benefits (see Box 3).

Essential PMTCT interventions during this period include the following:

- *Offering routine HIV testing and counseling.* If women were not tested before delivery, health care workers should counsel and test women and their babies during the immediate postpartum period (WHO 2010c). Testing and counseling services are an essential entry point for providing ART, infant feeding counseling, and HIV-related care and support (Rollins et al. 2007). Opportunities for testing should be available after discharge as well. A study in South Africa, for example, showed that screening all infants at immunization clinics was an acceptable and feasible way to identify infants living with HIV and refer them for ART (Rollins et al. 2009).
- *Providing fertility education, family planning counseling, and methods.* Pregnancy planning and management is a critical but often neglected component of postpartum HIV care and treatment services.

BOX 3. INTEGRATING PMTCT AND POSTNATAL CARE IN SWAZILAND

In Swaziland, where over one-third (39 percent) of pregnant women are living with HIV, the Ministry of Health and Social Welfare tested a project to integrate PMTCT into postnatal care. The intervention included staff training to promote high-quality care in the immediate postpartum period, infrastructure support to create a private space in the facility for PMTCT services, and ongoing monitoring and supervision. Pre- and post-intervention data showed considerable improvements, such as the following:

- Follow-up visits during the first three days postpartum increased by a factor of 20.
- The proportion of women and infants who received cotrimoxazole increased significantly.
- The number of male partners who received HIV testing increased significantly.
- The proportion of providers reporting that they had observed proper breastfeeding techniques increased from 20 to 80 percent, while the proportion of women giving mixed feedings decreased significantly.

This project demonstrates that targeted interventions in the postpartum setting are feasible and can improve client care, maternal behavior, and utilization of services (Mazia et al. 2009).

Women who want more children should receive counseling on healthy timing and spacing to protect their health and that of the planned child. Women who do not want to conceive should receive information on safe and accessible contraceptive options (including dual protection against pregnancy and STIs). Family planning methods, including condoms, should be available on the same day as the clinic visit.

- *Providing care and support for women, partners, and infants living with HIV.* Those who deliver postpartum care to women living with HIV should follow local protocols with additional attention given to the following areas:

- *Continuing care:* Routine care includes regular gynecologic exams, including Papanicolaou smears, treatment and care for HIV and opportunistic infections, and nutritional support as necessary. Women on ART should be encouraged to continue treatment after the delivery. When possible, partners or children living with HIV should receive referrals for treatment.

- *Health education:* Mothers who recently delivered should receive information on proper perineal and breast care, and on disposal of infectious materials (e.g., used sanitary pads). Providers should make sure that women and, if possible, their families know the postpartum and newborn danger signs.

- *Continuing infant feeding counseling and support.* Counseling and support for infant feeding can help to prevent malnutrition and morbidity and reduce the risk of HIV transmission (WHO 2010b). Providers should make sure that the mother living with HIV chooses her exclusive infant feeding option according to the national policy and that she receives education on her choice, including observation to ensure that she is feeding the infant properly.
- *Providing ART and ARV prophylaxis.* Research shows that ARV treatment and prophylaxis substantially reduces the risk of MTCT of HIV (WHO 2010a). Women living with HIV who are not yet in treatment can make breastfeeding safer by using ARVs themselves or giving ARVs prophylactically to their infants throughout the breastfeeding period (WHO 2010b).
- *Providing child health care.* Children of mothers living with HIV should receive a package of services, based on local needs and national policies, that includes HIV prevention, diagnosis, and treatment, as well as treatment for tuberculosis (TB), malaria, diarrhea, and other childhood risks as needed (Bryce et al. 2005; WHO 2006a, 2008b).

PROGRAM CONSIDERATIONS: KEY ELEMENTS OF INTEGRATION

To be sustainable, efforts to integrate PMTCT within MNCH services must be grounded in an enabling policy environment. That implies obtaining input and consensus from all stakeholders to address the key components of health services and systems—including policies, human resources, commodities management, and monitoring—from the local through the national levels. An enabling environment also requires clear policies and guidance covering every aspect of integration. Thus, integration entails a comprehensive “hearts and minds” commitment and coordination over time, and at many levels, to carry out the complex coordination necessary and to meet the challenges that will arise (WHO 2008c). This section describes general principles, specific elements of integration, and system challenges that program managers and policymakers must consider when developing strategies to integrate PMTCT and MNCH.

GENERAL PRINCIPLES

- *Consider the full system.* Managers and policymakers who plan to integrate PMTCT within MNCH should understand the elements of the health care system as well as gaps in existing services. Strategies for integration need to address both the clinical and organizational aspects of integration. National-level planning must consider opportunities to link services at all levels of the health system from primary- to tertiary-level facilities, including home- and community-based outreach and care (Rutenburg et al. 2002; WHO 2009b).
- *Use available evidence.* Integration of PMTCT within MNCH settings should build on evidence-based interventions and standards of care. The evidence base for interventions focused specifically on PMTCT/MNCH integration is still developing. However, reviews of MNCH interventions have

created a wealth of evidence about approaches that can improve maternal, newborn, and child mortality, and that can be delivered in health facilities and at the community level (Bryce et al. 2003; Darmstadt et al. 2005; Jones et al. 2003; Kinney et al. 2010; Lawn et al. 2005). There are also examples of effective service integration, mostly in the area of reproductive health. There is still a need to document and rigorously study more models of PMTCT/MNCH integration (WHO 2008c).

- *Develop aligned policies.* Creating an enabling environment for integration includes developing aligned policies for integration, creating evidence-based clinical and programmatic guidelines and norms for integrated services, ensuring a sustainable supply of PMTCT and MNCH commodities at the local and national levels, setting goals, and developing tools to measure progress toward these goals.

SPECIFIC PROGRAMMATIC APPROACHES

Establish Consensus at All Levels

Delivering PMTCT services throughout the continuum of maternal and infant care requires co-management of these services and PMTCT. National health planners can foster a coordinated organizational framework by holding integrated planning and capacity-building meetings for health care workers and managers, building partnerships with business communities and local nongovernmental organizations (NGOs), and strengthening strategies for community involvement and private sector participation. Co-supervision by the district teams responsible for MNCH and PMTCT services will enhance the delivery of services.

Integration may require action at all levels of the health system. It is critical for stakeholders to come to consensus on the package of interventions that comprise an integrated service delivery framework. Dialogue, careful planning, and strong coordination are essential for successful integration.

Develop Aligned Policies

A favorable national policy environment and political commitment are fundamental to the success of PMTCT/MNCH integration. Supportive policies form a platform for the implementation and scale-up of integration (WHO 2005).

The formulation of a policy framework can start with a consultative meeting at the national level to review existing policies, identify gaps in policies and resources, and begin to explore resource allocation at the national and district levels. Participants in this meeting should represent those directly concerned with PMTCT and MNCH, but also a broad range of related health disciplines and specialties. For example, while there has been considerable progress in joint planning and coordination between reproductive health and HIV teams at the national level, the integration of HIV services with child and adolescent health teams needs to be strengthened because these pillar departments are rarely engaged in integration consultations.

Policy development should include consideration about short- and long-term funding. There is a belief that fully implemented integration programs can result in cost savings, although much more research on this aspect of integration is needed (see Box 4). However, it is clear that resources are needed to implement integration. Policymakers and program managers should consider funding from the beginning of the planning process to ensure that resources are available and allocated in the budget.

Review Guidelines and Norms to Support Integration

Guidelines, strategies, and roadmaps typically exist at the national level for MNCH, reproductive health, and PMTCT. Many of these policies have been revised recently in light of WHO and UNICEF recommendations, and because of greater attention on achieving the health Millennium Development Goals by 2015. Also, WHO's PMNCH has developed essential care packages for integrated PMTCT/MCNH programs.

BOX 4. DOES INTEGRATION SAVE COSTS?

A belief underlying integration is that combining services will save costs for clients and programs. Experiences from a PMTCT/MCNH integration program in Tanzania suggest that particular strategies at the facility level may lower service delivery costs while improving quality of care, such as:

- Transitioning clinical staff from fee-for-service payment to salaries
- Planning PMTCT transport and activities in conjunction with other services to consolidate resources
- Unifying and consolidating planning, reporting, and management tools and teams
- Leveraging the same internal control systems for multiple service streams.

Implementers from the Tanzania program advocate for horizontally integrated resources instead of separate, parallel funding and administrative mechanisms. Horizontal integration allows decision makers at the local level to allocate resources where they will be most effective and reduces human resource turnover from one specialty to another due to disparate funding streams (Evjen-Olsen, Evjen-Olsen, and Kvale 2009).

Resources for implementing and scaling up PMTCT/MNCH integration need to be allocated from the outset—including funding for developing integration systems, building staff capacity, and ensuring availability of commodities. Program experiences have generated a range of measures that may leverage additional resources or provide cost savings for the program, including the following:

- *Establish public/private partnerships.* These partnerships can help to leverage co-funding to increase PMTCT coverage and program impact. This strategy was implemented in Uganda by Plan International (Lukoda and Gibson 2008).
- *Improve supply systems.* In Zimbabwe, the Ministry of Health improved efficiency of PMTCT commodities management by integrating the distribution of PMTCT supplies with the existing, successful contraceptive distribution system (Kajuwa et al. 2008).
- *Adopt cost-saving measures such as using generic ARV drugs and rapid HIV testing.*

These existing guidelines, adapted to address the local context, should be the starting point for developing guidance and standard operating procedures on integration. All partners in integrated care, including NGOs and private practitioners, should adhere to national policies and procedures (WHO 2008c). Guidance on integration should include the following topics, among others:

- Infant feeding, testing, and treatment, specifying cotrimoxazole at six weeks, dry blood testing, and initiation of ART if necessary
- Counseling and support on nutrition and infant feeding, ART eligibility, and treatment for infants and children
- Procedures ensuring a single point of contact for mother/infant testing, counseling, and treatment
- Procedures to ensure linkage of PMTCT and MNCH services.

There need to be mechanisms to ensure that both HIV and MNCH policies and guidelines are kept current with available scientific evidence and best practices (e.g., revised WHO guidelines and joint statements by WHO/UNICEF on best practices).

Develop Plans, Goals, and Monitoring Tools

In addition to procedural guidelines, integration requires development of operational plans with specific goals, and tools for monitoring progress made toward integration and the degree to which programs have achieved their goals. Governments and international organizations have developed a range of tools and monitoring methods (see “Resources”) that can be adapted to national or local needs. Communities and the private sector should participate in the development and adaptation of tools to ensure a holistic approach to care.

Strengthen Health System Components

Strong health care systems—including public, community-based, and private systems—are

necessary to improve the quality of care and support the implementation, testing, and scale-up of integrated services. Integration can occur within any of the major components of the health system, including human resources, infrastructure, procurement, clinical care, and information systems. These components are further detailed in the sections below.

Build Human Resource Capacity

Integration may require restructuring and reorganizing human resources at various levels of the health system for improved coordination and efficiency. Health care workers may need training to deliver integrated care in MNCH and HIV and to facilitate referrals with other components of care. For example, providers of well-baby and sick-baby services often have no orientation with HIV. Staff training should not neglect key maternal health interventions with PMTCT. Countries with high HIV prevalence and subsequently high rates of MTCT also have high maternal and newborn mortality and morbidity. Thus, training on emergency obstetric care and neonatal resuscitation, improved obstetric practices (e.g., effective management of prolonged labor and management of postpartum hemorrhage), and universal precautions for infection prevention support both maternal health and HIV prevention goals.

Health workers should also receive training in personal skills including self-assessment of values and attitudes, perception of empowerment, and knowledge and skills. Facilities should have a mechanism that allows health workers to confidentially access services they may need for their own health, such as HIV testing and counseling. Preservice training will likely need adapting to include elements of integrated service delivery and program management (UNICEF 2008).

Country programs will need to specify how different services will be linked and what role different

providers are to play. For example, should child health care providers provide some package of pediatric HIV care? What components can they provide, and for what services should they refer? The service delivery models that most effectively increase access and coverage will depend on the local context.

Addressing staff shortages in the health systems coping with high HIV prevalence is imperative but may take time to achieve. Achieving integration may require task-shifting, because nurses, midwives, and community health workers may be struggling to manage their existing workload.

Short-term solutions include in-service training to strengthen health workers' knowledge and confidence in providing integrated services in MNCH and HIV. Training less skilled health workers and empowering lay health care workers may help to address human resource challenges (Sanjana et al. 2009; Shumbusho et al. 2009). Training should be streamlined to build providers' capacity without removing them from their practice for long periods.

Long-term solutions for human resource shortages include opening more health professional schools; training more health professionals including doctors, nurses, and midwives; and providing incentives that encourage trained providers to remain in low-resource settings (Tawfik and Kinoti 2006). Human resource functions and tasks will need to be integrated across priority programs through preservice and in-service training, support and protection of health care providers, and promoting trust and partnerships among all stakeholders.

Prioritize Systemic Challenges

Policymakers and program managers also need to address issues that are general problems in many health systems. Aspects of these issues can be prioritized for the purpose of integration. These issues are as follows:

- *Improve quality of care.* Improving quality of care needs to be a data-driven process that identifies gaps between recommended guidelines and practice and then implements and evaluates measures to bridge the gaps. Again, research-proven approaches should be implemented to improve service quality. At higher level facilities and in the broader district, regional, or national context, health teams can implement ongoing quality assurance practices.
- *Adapt infrastructure to support integrated service delivery.* A good work environment can facilitate better integration of PMTCT and MNCH services and reduce workload (Israel and Kroeger 2003). Adaptations to improve the work space can range from simple (i.e., assigning a space for services or reorganizing consulting rooms) to complex (i.e., building new rooms or spaces). The work environment should meet environmental health standards and should allow provision of confidential PMTCT services without disrupting existing clinical services (Fawcus, van Coeverden de Groot, and Isaacs 2005).
- *Support integrated procurement and supply management systems.* A functioning supply chain system is a prerequisite for effective PMTCT/MNCH integration. Ensuring a sustainable supply chain that supports integration through testing and scale-up will require review of national supply systems and policies early in the planning process. A recommended approach is to align procurement for PMTCT and MNCH with the wider HIV commodities procurement chain and ultimately with the national health commodity supply chain (Fawcus, van Coeverden de Groot, and Isaacs 2005; UNICEF 2008).
- *Strengthen laboratory capacity.* Laboratory services are fundamental to PMTCT services; they are critical for diagnosis, illness staging, and monitoring. Laboratory services must be accurate, consistent, and dependably able to assess and manage patients with various illnesses, including malaria, TB, syphilis,

diarrhea, and respiratory diseases. CD4 testing and EID testing must be strategically placed within MNCH services to minimize loss to follow-up and support ART adherence.

- *Develop information systems to support integrated patient tracking.* Record keeping is key to both patient management and program monitoring, but tracking systems are often weak in low-resource countries. Patient management works best when all patient health information—related and not related to HIV—is located in one patient medical record, chart, or file (WHO 2005, 2006b). To facilitate patient tracking and performance monitoring, policymakers should make sure that providers and program managers adhere to national guidelines on minimum data and use standard forms and registers at every level.

Ministries of Health can support PMTCT/MNCH integration by linking the services within the national health information system and by establishing linkages with services for malaria, TB, and other diseases (WHO 2008a). A coordinating body should be assigned to oversee the collection and use of data on integration. Both the national health information system and clinical forms for integrated services should include indicators on pregnancy, family planning, nutrition, immunization, cotrimoxazole prophylaxis, HIV test results, and TB screening and treatment. Box 5 describes some of the record keeping strategies of the integrated PMTCT/MNCH services in Zambia.

CHALLENGES TO PREVENTION OF MOTHER-TO-CHILD TRANSMISSION AND MATERNAL, NEWBORN, AND CHILD HEALTH INTEGRATION

Many of the challenges to integration are endemic within health care systems in developing countries. PMTCT integration poses specific challenges, including the following:

- *Stigma and discrimination.* Providers may hesitate to offer services to women living with HIV. Also, clients frequently avoid attending facilities that are known to provide HIV services (Israel and Kroeger 2003). However, there are numerous examples documenting successful integration through a variety of means, including provider education, community outreach, and other measures.

BOX 5. COORDINATING INTEGRATED SERVICES IN ZAMBIA

Linkages and integration with MNCH are the hallmarks of the Zambian national PMTCT program. The goals of the Zambian national PMTCT strategic framework include improving child survival and development by reducing infant and childhood morbidity and mortality related to HIV, and decreasing maternal mortality through improved antenatal, childbirth, and postnatal care services. The Reproductive Health Unit of the Central Board of Health coordinates and harmonizes all partners' activities, integrates PMTCT into MNCH services, and links these programs to youth-friendly services as well as TB and HIV programs. Today, PMTCT services are integrated in all of Zambia's 72 health districts. PMTCT has strengthened the safe motherhood program by utilizing PMTCT funds to support systems for safe motherhood services such as tetanus toxoid immunization, malaria and anemia prophylaxis, postnatal care, and family planning.

Staff at different service delivery points are trained to provide information and refer clients across services. Tools and job aids for integration include the safe motherhood register, maternity counseling job aids, mother's birth preparedness cards, mother's cards, and child's cards. The integrated antenatal and postnatal registers indicate when women should be followed up for infant feeding counseling and checks of the infant's HIV status. This targeted approach has allowed some facilities to initiate 6- and 18-month follow-up despite staff shortages. In two peri-urban districts, the program is also utilizing traditional birth attendants who have been trained in essential newborn care. The traditional birth attendants promote postnatal care by encouraging women to visit health facilities within 72 hours after childbirth, and also promote this service through breastfeeding support groups (WHO 2006a).

- *Sociocultural and gender-related barriers.* Religious beliefs, cultural customs, gender inequities, gender norms, gender-based violence, poverty, and power relations between men and women need to be addressed—both at the facility and policy levels—for successful integration.
 - *Funding weaknesses.* PMTCT services are usually funded separately from MNCH programs, and very often both programs are underfunded—especially at low-level facilities. This makes it difficult to fully integrate PMTCT as a core component of maternal and child care, and takes a particular toll on remote and very poor communities (Druce and Dickinson 2006). Additionally, integration will not solve the problem of underfunding; managers need to examine the true cost of services and provide resources to support them (WHO 2008c).
 - *Human, logistical, and technical resources.* Many health systems are already struggling with severe shortages of skilled providers, equipment, and supplies. This results in providers being overwhelmed with multiple responsibilities for the services they already provide. Because integration will potentially increase this load, it is critical that additional resources, or specific strategies for supporting providers and establishing a reliable supply chain, be an integral part of the planning and implementation (Israel and Kroeger 2003).
- Integration initiatives in difficult environments may yield mixed results. Box 6 illustrates the mixture of successes with challenges in PMTCT/MNCH integration programs.

BOX 6. PREVENTION OF MOTHER-TO-CHILD TRANSMISSION AND MATERNAL, NEWBORN, AND CHILD HEALTH INTEGRATION IN KWA-ZULU NATAL PROVINCE

In South Africa's Kwa-Zulu Natal (KZN) province, over half of pediatric deaths are caused by HIV. In this setting, as in other high prevalence areas, there is a clear need for a PMTCT approach that leverages every opportunity to identify women and babies living with HIV and initiate treatment.

An evaluation of implementation and integration of PMTCT services into routine MNCH health services in KZN found program successes, such as 97 percent testing coverage during ANC and over 70 percent of eligible women receiving nevirapine in intrapartum/postnatal settings. Approximately 78 percent of the women interviewed for the evaluation reported receiving CD4 testing.

Challenges included fragmented integration, lack of clarity about health care workers' roles and responsibilities, and weak record keeping. For example, although many women reported receiving CD4 testing, the testing was only recorded for 47 percent of those women. If PMTCT is going to be fully implemented, clinicians must be able to consistently provide and fully document quality services at each point in the continuum of care. Evaluators also found that PMTCT was offered in particular settings but not others, which potentially exacerbates issues of stigma, as women may not seek services that are associated with PMTCT and would reveal their HIV status. Also, few PMTCT services were available at the immunization clinic, and health workers were unclear about their roles at the clinic. Less than half of the babies of mothers living with HIV received the heel prick for HIV testing, and only about 42 percent of women living with HIV reported receiving follow-up regarding their own care.

The challenges this program experiences are not unique to KZN. As in many settings, in KZN PMTCT is a vertical program. Its administration and funding are controlled by the national HIV coordinating body—a situation that creates barriers for comprehensive integration. Also, a high proportion of women attend ANC for the first time in their third trimester, underscoring the importance of community outreach that encourages women to seek care earlier, so that they receive PMTCT services at the appropriate time. Finally, to ameliorate the burden of asking health care workers to add PMTCT services to existing heavy workloads, many clinics like those in KZN shift some tasks to lay counselors. While task-shifting holds promise for delivering high-quality services to more women with minimal cost increase, roles and responsibilities along the continuum of care must be clearly defined to avoid missed opportunities (Horwood et al. 2010).

CONCLUSION

Governments in many developing countries face alarming rates of maternal and infant mortality and morbidity due to a large extent to HIV in mothers, their infants, and their families. Integration of PMTCT and MNCH services has the potential to address critical gaps in HIV prevention, testing, and treatment by increasing access and adherence to services related to HIV throughout the continuum of maternal care. Comprehensive PMTCT/MNCH integration may also increase women's access to HIV services while maintaining or increasing the quality of the services they receive.

Policymakers and program managers who want to develop, implement, or scale-up integrated PMTCT/MNCH programs must undertake a comprehensive examination of existing clinical and policy practices, national and international guidelines, and essential care packages to create an enabling environment for integration. Integration at the clinical level entails improving care and creating multiple opportunities—before, during, and after pregnancy—to prevent, detect, and treat HIV and maintain the health of women and infants. Policymakers and program managers can support clinical practice by developing a comprehensive, goal-oriented strategy for integration; producing evidence-based guidance to guide the process; fostering partnerships among state, community, and private sector health workers; and monitoring the progress made toward integration goals.

Full integration requires commitment at all levels, from national to local, and from multiple stakeholders including the public sector, nongovernment and community representatives, and the private sector. Policymakers and stakeholders must ensure that the major components of the health system, including human resources infrastructure and supplies, and information systems, are aligned to ensure high-quality

care, appropriate treatment, documentation, and follow-up. Thus, integration is a complex undertaking. However, fully implemented, PMTCT/MCNH integration can support improved health and lead the way to family-centered, sustainable care that benefits mothers and infants, families, communities, and countries.

RESOURCES

Clinical Guidelines for Improving Maternal, Newborn, and Child Health in the Context of HIV

Documents on Integrated Management of Childhood Illnesses (IMCI) Listed by Year of Publication. Available at http://www.who.int/child_adolescent_health/documents/imci/en/index.html (accessed October 5, 2010)

Integrated Management of Adolescent and Adult Illnesses (IMAI)/ Integrated Management of Childhood Illnesses (IMCI) Publications. Available at <http://www.who.int/hiv/pub/imai/en/index.html> (accessed October 13, 2010)

Integrated Management of Pregnancy and Childbirth (IMPAC): Pregnancy, Childbirth, Postpartum, and Newborn Care: A Guide for Essential Practice. Available at http://www.who.int/making_pregnancy_safer/publications/PCPNC_2006_03b.pdf (accessed October 5, 2010)

Programmatic Tools to Support Integration of HIV/Maternal, Newborn, and Child Health Services

Guidance on Ensuring Effective Supply Chain Planning for Commodities Needed for Implementation and Scale Up of Services for the Prevention of Mother to Child Transmission (PMTCT) of HIV Infection. Available at http://www.unicef.org/supply/files/Guidance_Supply_Chain_Planning_PMTCT_July2008.pdf (accessed October 5, 2010)

HIV and Infant Feeding: Framework for Priority Action, Guidelines and Related Tools. Available at http://www.who.int/child_adolescent_health/documents/pdfs/hiv_if_slide_set.pdf (accessed October 13, 2010)

Increasing Access to Contraception for Clients with HIV: A Toolkit. Available at http://www.fhi.org/training/en/modules/FPHIV_toolkit/interface.pdf (accessed October 5, 2010)

Integrating HIV Prevention and Care into Maternal and Child Health Care Settings: Lessons Learned from Horizons Studies. Available at <http://www.popcouncil.org/pdfs/horizons/mchconskenya.pdf> (accessed October 5, 2010)

Prevention of Mother-To-Child Transmission (PMTCT): Briefing Note. Available at <http://www.who.int/hiv/pub/toolkits/PMTCT%20HIV%20Dept%20brief%20Oct%202007.pdf> (accessed October 5, 2010)

Prevention of Mother-to-Child Transmission of HIV Generic Training Package. Available at <http://www.womenchildrenhiv.org/wchiv?page=pi-60-00> (accessed October 5, 2010)

Prevention of Mother-to-Child Transmission of HIV/AIDS Programmes. Available at http://www.who.int/pmnch/media/publications/aonsectionIII_7.pdf (accessed October 13, 2010)

Profiles of Health Facility Assessment Methods. Available at <http://www.cpc.unc.edu/measure/publications/pdf/tr-06-36.pdf> (accessed October 13, 2010)

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