Recent gains in child survival rates are threatened by the HIV/AIDS epidemic. Each year, approximately 600,000 infants, most of them in sub-Saharan Africa, are born with HIV infection as a result of mother-to-child transmission of HIV. The rising number of HIV-infected children places an enormous burden on families and the health care system. Mother-to-child transmission of HIV can be greatly reduced by expanding high quality antenatal and obstetric care, voluntary HIV counseling and testing (VCT), antiretroviral drug therapy, and the use of breast milk substitutes or exclusive breastfeeding. Programs for prevention of mother-to-child transmission (PMTCT) can have an additional public health impact by reaching HIV-negative women who receive information, skills training, and support for preventive behaviors. Through operations research, Horizons seeks to identify cost-effective approaches to providing PMTCT services that meet the needs of women and their families.

Examining Feasibility, Acceptability, and Impact

The governments of Kenya and Zambia are testing comprehensive packages of PMTCT services in antenatal clinics. The Horizons Program and its partners are supporting this pilot implementation by assessing the acceptability, operational barriers, cost, and impact of the services on mother-to-child HIV transmission, child morbidity and mortality, and maternal wellbeing. The major research activities are the establishment of record-keeping systems to track utilization of the various interventions, following a cohort of clinic users for 12-18 months, observation of quality of care, and an economic analysis of the intervention. The study contributes to an international effort led by UNICEF and UNAIDS to produce critically needed information for making informed choices and developing best practices for PMTCT.

In Kenya, Horizons is implementing the study with the Network of AIDS Researchers in East and Southern Africa, in collaboration with the Ministry of Health, National AIDS Control Program, and UNICEF/Kenya. In Zambia, Horizons is working with the Mother-to-Child-Transmission Working Group, appointed by the National AIDS Council; UNICEF/Zambia; Japan International Cooperative Agency; and Norwegian Agency for Development Cooperation.

The Horizons Program is also the research partner in a consortium implementing Zambia’s Ndola Demonstration Project. This project focuses on optimizing infant feeding practices while reducing risk of HIV transmission for children, women, and men by integrating improved counseling on infant feeding practices and maternal nutrition as well as VCT into health and community services.

Additionally, Horizons is assisting UNICEF with an evaluation of their PMTCT pilot program, documenting actual experiences and lessons learned in order to develop a
“practical” programming framework for use by country teams to initiate or scale up PMTCT programs. The evaluation activities include a review of experience in the 13 pilot sites based on reports and interviews with key informants and a rapid assessment of program achievements and constraints in Zambia, Rwanda, and Honduras.

Introduction of PMTCT Services

The uptake of the PMTCT interventions in Kenya and Zambia reflects both the capacity of the clinic to provide the services and the acceptability of the intervention to clinic attendees (see table). Clinics such as Chipata with large client loads struggle to provide sufficient numbers of counselors to meet the demand for pretest counseling. The proportion of women who receive counseling and go on to have an HIV test is affected by the quality of that counseling as well as the openness of the individual and the community to HIV testing and the ability to cope with a possible positive test result. For example, extensive community mobilization activities in Mbala town appear to be associated with a significant uptake of HIV testing among women who received pretest counseling. The Kenya PMTCT program is using a mix of AZT and nevirapine to maximize the proportion of HIV-positive women who receive antiretroviral drugs at the critical time during late pregnancy and labor. We expect that the capacity of the clinic to provide services and client acceptability of PMTCT services will grow as the programs mature.

Following the first nine months of intervention in the Ndola Demonstration Project, there was a significant increase in mothers reporting exclusive breastfeeding, from 56 percent (n=209) at baseline to 76 percent (n=319). The proportion of providers who are aware that reducing MTCT through infant feeding counseling is about options and depends upon the mother learning her HIV status rose from 6 percent (n=62) to 14 percent (n=65), and the proportion of mothers of babies six months or younger who went for VCT increased from 6 to 15 percent. However, there is still considerable work to be done to firmly establish the norm of informed choice among providers and expectant mothers.

Table 1  Provision of PMTCT interventions at selected sites in Kenya and Zambia

<table>
<thead>
<tr>
<th>Site</th>
<th>Period</th>
<th>Number of first antenatal visit attendees</th>
<th>Received pretest counseling¹</th>
<th>Chose to have HIV test²</th>
<th>Tested positive for HIV³</th>
<th>Received ARVs⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kenya</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Karatina</td>
<td>9/00 - 12/01</td>
<td>4,026</td>
<td>3,610 (90%)</td>
<td>2,108 (58%)</td>
<td>216 (10%)</td>
<td>83 (38%)</td>
</tr>
<tr>
<td>Homa Bay</td>
<td>9/00 - 12/01</td>
<td>2,923</td>
<td>2,485 (85%)</td>
<td>1,135 (46%)</td>
<td>418 (37%)</td>
<td>172 (41%)</td>
</tr>
<tr>
<td><strong>Zambia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chipata</td>
<td>3/00 - 3/02</td>
<td>8,843</td>
<td>3,025 (34%)</td>
<td>1,562 (52%)</td>
<td>436 (28%)</td>
<td>244 (56%)</td>
</tr>
<tr>
<td>Mbala &amp; Tulemane</td>
<td>10/00 - 3/02</td>
<td>2,421</td>
<td>1,666 (69%)</td>
<td>1,439 (86%)</td>
<td>224 (16%)</td>
<td>65 (29%)</td>
</tr>
</tbody>
</table>

¹Denominator = First antenatal visit attendees. Numerator includes couples counseled.
²Denominator = Received pretest counseling. Numerator includes couples tested.
³Denominator = Chose to have an HIV test. ⁴Denominator = HIV-positive women.
From the outset, program managers identified the need to involve male partners as a critical program element. Program strategies for informing male partners about PMTCT services and encouraging their support include inviting men to the clinic for HIV counseling and testing, community education on PMTCT in locales where men congregate, and support groups for men. An analysis of the cohort data from Kenya shows a significant increase in discussions about VCT and MTCT with male partners by women who were exposed to the PMTCT program and significant increases in HIV testing among partners (see figure).

Additionally, these programs play a valuable role as entry points to care and support for HIV-positive women. In Zambia, for example, the program links clients with other programs that offer nutritional supplementation and provide prophylaxis for TB and other opportunistic infections, as well as to community organizations that provide counseling, economic support, and child care. Health workers who receive training and supplies for PMTCT feel newly empowered to improve conditions to benefit the health of women and children and have achieved new status among their clients and communities. Overall, the introduction of PMTCT services appears to have rekindled interest in lobbying for better quality antenatal and delivery care, and the programs in Kenya and Zambia are championing changes in policies, service delivery practices, and resource allocation.

**Operational Successes and Challenges**

The introduction of PMTCT services has been accompanied by a number of operational success and challenges.

- Although programs appear to be adequately training health workers, motivating and supervising staff who provide HIV-related services remains a challenge.
- The introduction of voluntary counseling and testing services into the ANC setting has been popular among clients, but programs now face the problem of maintaining this demand and coping with success.
- Progress has been especially slow in adequately addressing the follow-up needs of mothers, whether or not they are infected with HIV.
- General shortcomings of health systems including shortages of staff and medical supplies, inadequate supervision, and lack of good monitoring and evaluation, which continue to hobble efforts to integrate PMTCT into MCH settings.

![Figure 1 Male involvement in Karatina, Kenya](image)
Practical Strategies for Enhancing Effectiveness and Scaling-up

- **Make PMTCT the norm in MCH care.** Health workers and their clients should view PMTCT services as a routine part of the MCH care experience. Programs can act broadly to bring about such change, including appropriately training health workers (both pre-service and in-service), adjusting policies and clinic procedures, and influencing public attitudes.

- **Strengthen ties between the MCH clinic, outside sources of care, and the community,** including other public sector health services, NGOs, the private commercial sector, lay workers, families, husbands, and community leaders to encourage participation and provide comprehensive care. Such efforts will also help to address of stigma by helping to change community norms.

- **Promote incremental, low-cost changes.** Although a PMTCT program may require a large initial investment in training, supervision, and supplies, many strategies for improving services such as modifying the frequency of antenatal visits, redefining job descriptions, or rotating counseling responsibilities require relatively little outlay. Program officials who want to make improvements, yet face budget constraints, can consider such gradual changes in operations.

**Tools and Reports**

Working with its partners, Horizons has developed a training curriculum for health workers and supervisors, community leaders, organizations for people living with HIV/AIDS, and program managers that addresses the roles of clinics and communities in preventing mother-to-child HIV transmission. *PMTCT Curriculum, Kenya PMCT Project (Population Council 2002).*

In July 2001, Horizons brought together study investigators and service managers to highlight what has and has not worked in terms of program feasibility, acceptance, and effectiveness and to make recommendations for replication and scale-up. A synthesis of these discussions is available in *Integrating HIV Prevention and Care into Maternal and Child Health Care Setting: Lessons Learned from Horizons Studies* ([www.popcouncil.org/pdfs/horizons/mchconskenya.pdf](http://www.popcouncil.org/pdfs/horizons/mchconskenya.pdf)).

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