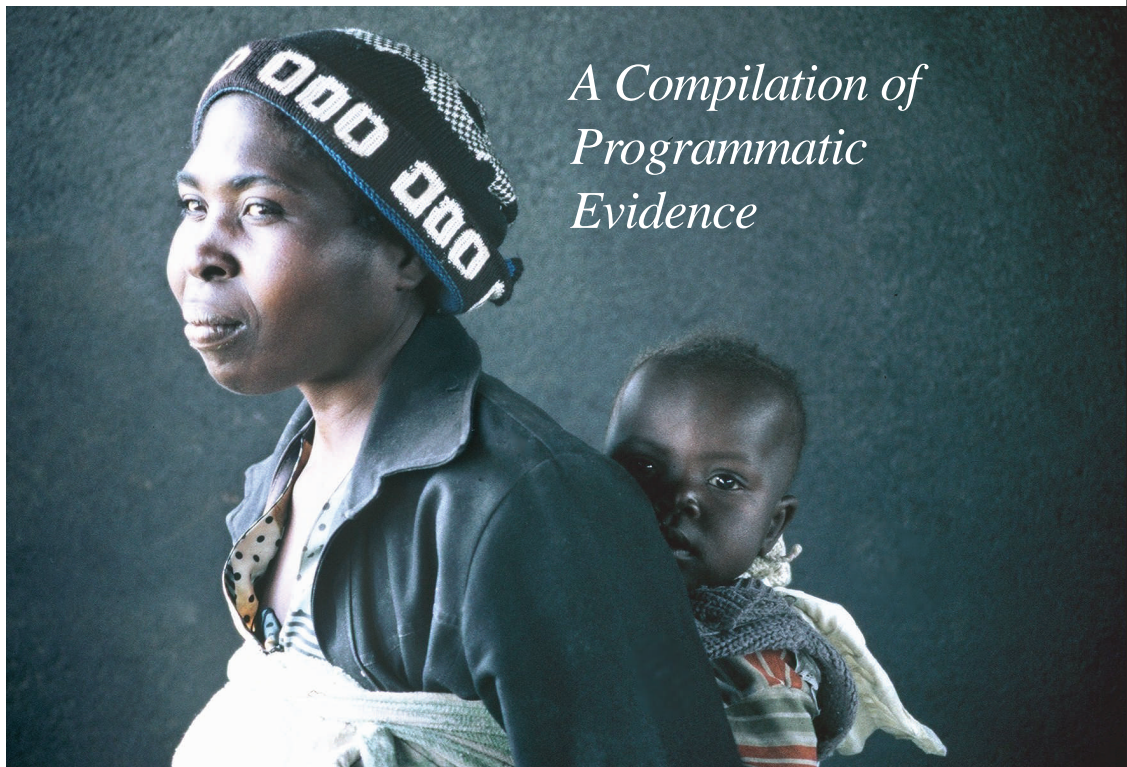


# HIV *and Infant Feeding*



*A Compilation of  
Programmatic  
Evidence*



July 2004

# *HIV and Infant Feeding: A Compilation of Programmatic Evidence*

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## *Foreword*

There has been worldwide recognition of the HIV/AIDS pandemic for nearly 20 years. More recently there has been recognition of HIV transmission through breastfeeding, but our understanding of the biological and programmatic implications of this mode of transmission remain poor due to insufficient study and difficulties of interpretation. Biological studies have been hampered by ethical constraints related to concerns for the survival of the child, as well as by all of the difficulties inherent in the study of breastfeeding. These constraints include the fact that one cannot ethically or reliably assign individual mothers to specific infant feeding groups or blind the mother or investigator to the behaviour under study.

Our understanding of the programmatic issues and constraints is also lagging. One might speculate that the rapid progression of the epidemic and the vast number of variables inherently associated with programme planning and evaluation preclude our waiting patiently for several years to interpret operations research or practise evidence-based applied research. The cost of applied research is also a barrier. Where we do have 'findings,' there are often so many confounding variables that the evidence is subject to wide-ranging interpretation. In addition, ongoing field research and the study of HIV/AIDS treatment modalities have created an extremely dynamic situation, with rapidly changing ideas and directions.

Therefore, if we wish to improve our programmatic approaches, we must step very carefully among the findings and reflect on our limited understanding of programme issues from whatever data that become available. It is fortunate that many who initiated interventions, large and small, felt compelled to document them and share their findings. The widely diverse reporting outlets, both published and unpublished, are sometimes referred to as 'grey' literature.

This project attempted to find, summarise, and analyse reports on a wide variety of relevant programmes conducted since the 1998 guidelines were issued in order to glean lessons that can inform future programmes. The valuable experiences represented in this compilation range in scale from small community research projects to national programmes. This is the product of a collaboration between the United Nations Children's Fund (UNICEF) and the Quality Assurance Project (QAP), managed by University Research Co., LLC (URC), with funding from the United States Agency for International Development (USAID). Valuable technical inputs were also received from the World Health Organization (WHO) and many individuals and organisations directly involved in HIV and infant-feeding programmes worldwide. This review brings together a number of important experiences and provides a variety of insights that should be useful to those involved in updating the international guidelines or adapting them to local settings. It should also serve as a valuable resource to those involved in developing or scaling-up programmes to prevent mother-to-child transmission.

UNICEF is grateful for this effort. We hope that some day, looking back, we will see that this challenging step toward organising current experience has aided future programme design and execution for the benefit of every child, and has helped us in our efforts to better address the complex issues associated with HIV and infant feeding.

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## Executive Summary

The United Nations-led process of updating the 1998 international guidelines related to infant feeding and the prevention of maternal-to-child-transmission (pMTCT) of HIV called for a review of recent programmatic experience in addition to a review of the new scientific and medical evidence. This document represents an attempt to compile and synthesise reports on a wide variety of relevant programmes conducted since the 1998 guidelines were issued. The programmes presented here range in scale from small community research projects to national programmes. This document is the product of a one-year collaboration between the United Nations Children's Fund (UNICEF) and the Quality Assurance Project (QAP), managed by University Research Co., LLC (URC). Valuable technical inputs were also received from the World Health Organization (WHO) and many individuals and organisations directly involved in HIV and infant feeding programmes. This review brings together in one document a number of important experiences and provides insights that were useful to those involved in updating international guidelines and those involved in adapting them to local settings. It should also serve as a valuable resource to those involved in developing or scaling-up pMTCT-related programmes in the future.

The methodology involved three phases: compilation, document summarisation, and synthesis of key finding organised by themes:

- **Compilation:** Relevant programs were identified, and documents describing these programmes were obtained from a variety of sources. Over 100 documents from 20 countries, including formative research, assessments and evaluations, mid-term and final reports, national guidelines, conference and meeting reports, educational and counselling materials, interviews with key informants, and a few published articles were reviewed. Finally, 45 reports on programmes and multi-site studies were selected for inclusion.
- **Document summarisation:** An editorial team wrote and reviewed two-to-four page summaries for the selected studies, and the authors of the original documents reviewed many of the summaries.
- **Synthesis:** The editorial team also wrote a synthesis of the 45 selected reports, drawing out key themes specifically related to HIV and infant feeding. The key themes include the major infant feeding modalities:
  - Replacement feeding (both commercial and home-prepared formula);
  - Exclusive breastfeeding (including appropriate cessation and transition to other feeding modalities);
  - Mixed feeding and its risks; and
  - Breast-milk feeding (wet nursing, breast-milk banks).

The key themes also include the desired AFASS characteristics (acceptability, feasibility, affordability, sustainability, safety) of infant-feeding modalities; counselling and informed choice; the roles of partners, families, and communities; and behaviour change and communication as a problem-solving strategy.

The compilation addresses numerous controversial topics and constraints, including human resources (inadequately trained and insufficient counsellors); confused mothers; stigma and discrimination; spillover of replacement feeding; free or subsidised infant formula; family economics; and the difficulty in providing integrated HIV testing, informed-choice counselling, community support, logistics, and follow-up care for mothers and infants.

Efforts should be made to encourage more documentation and dissemination of experiences by individual programmes and to continue to identify and share this information. To facilitate additional analysis, review, or research by interested readers, most of the original source documents have been converted to digital format and are available at [www.qaproject.org](http://www.qaproject.org). Contact information for editors, researchers, authors, and organisations responsible for preparing the source material is also included to encourage future communication; continuing dialogue; and the sharing of materials, ideas, and lessons learned between projects, countries, and regions of the world.

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# *List of Abbreviations*

AED	Academy for Educational Development	IBFAN	International Baby Food Action Network
AFASS	Affordable, feasible, acceptable, safe and sustainable	ICASA	International Conference on AIDS and Sexually Transmitted Illnesses in Africa
AIDS	Acquired Immunodeficiency Syndrome	ICRW	International Centre for Research on Women
ANC	Antenatal care	IDI	In-depth interview
ARV	Antiretroviral (drug)	ICYF	Infant and Young Child Feeding
AZT	Azidothymidine (zidovudine or ZVD)	IEC	Information, education, and communication
BCC	Behaviour change communication	IF	Infant feeding
BF	Breastfeeding	IFC	Infant-feeding counselling
BFHI	Baby Friendly Hospital Initiative	IFP	Infant-feeding practise
BM	Breast milk	IMCI	Integrated Management of Childhood Illness
BPNI	Breastfeeding Promotion Network of India	IRB	Institutional review board
CBO	Community-based organisation	KAP	Knowledge, attitudes, and practises
CBoH	Central Board of Health	KHC	Kicukiro Health Centre
CDC	Centers for Disease Control and Prevention	KI	Key informant interview
CF	Complementary foods	KZN	KwaZulu-Natal, South Africa
CHC	Community health clinic	MCH	Maternal and child health
CHW	Community health worker	MF	Mixed feeding
DHS	Demographic health survey	MMF	Mixed-milk feeding
EBF	Exclusive breastfeeding	MOH	Ministry of Health
EBM	Expressed breast milk	MOU	Memorandum of Understanding
EPI	Expanded Programme of Immunisation	MTCT	Mother-to-child transmission
ESARO	Eastern and Southern African Regional Office (UNICEF)	MU-JHURC	Makerere University-Johns Hopkins University Research Center
FF	Formula feeding	NACO	National AIDS Control Organization
FGD	Focus group discussion	NDP	Ndola Demonstration Project
FP	Family planning	NFNC	National Food and Nutrition Commission
GM	Growth monitoring	NGO	Nongovernmental organisation
GMP	Growth monitoring and promotion	NVP	Nevirapine
GOB	Government of Botswana	OR	Odds ratio
HEBM	Heat-treated expressed breast milk	PAHO	Pan American Health Organization
HIFC	WHO/UNICEF HIV and Infant Feeding Counselling (course)	PBF	Predominant breastfeeding
HIV	Human immunodeficiency virus	PCP	Pneumocystis carinii pneumonia
HIV-	HIV-negative	PCR	Polymerase chain reaction (HIV test)
HIV+	HIV-positive	PLWHA	People living with HIV/AIDS
HW	Health worker	pMTCT	Prevention of mother-to-child transmission
IATT	Interagency Task Team on Prevention of HIV in Pregnant Women, Mothers and their Children	PTCT	Parent-to-child transmission
		RCT	Randomised control trial



RF	Replacement feeding	UNICEF	United Nations Children's Fund
RH	Reproductive health	URC	University Research Co., LLC
SAFAIDS	Southern African HIV and AIDS Information Dissemination Service	USAID	United States Agency for International Development
STI	Sexually transmitted infection	UTH	University teaching hospital
TBA	Traditional birth attendant	VCCT	Voluntary and confidential counseling and testing
TIPS	Trials in improved practises	VCT	Voluntary counseling and testing
TOT	Training of trainers	WABA	World Alliance for Breastfeeding Action
UNAIDS	Joint United Nations Program HIV/AIDS	WHO	World Health Organization
UNFPA	United Nations Population Fund	ZDV	Zidovudine (Azidothymidine (AZT))

# INTRODUCTION AND METHODOLOGY

In 1997, the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and the Joint United Nations Programme HIV/AIDS (UNAIDS) issued a Joint Policy Statement on HIV and Infant Feeding,<sup>1</sup> followed shortly by the development of a set of international infant-feeding guidelines for the prevention of mother-to-child transmission (pMTCT)<sup>2</sup> of HIV in 1998. Four years later, when the international and scientific community called for an update of these guidelines, interest was expressed in reviewing not only the new scientific and medical evidence but also recent programmatic experience, as part of the process. Many pMTCT-related activities, ranging from small-scale community research projects to a number of pilot and national programmes, have been implemented since the 1998 guidelines were issued. This experience provides valuable insights and important evidence related to HIV and infant feeding in a number of settings and across a range of social and economic conditions.

To date, specific studies have been conducted, or are currently in progress, to assess various recommended feeding options for HIV-positive mothers and inform programme development. However, much of this experience has not been formally documented. The results of programme evaluations are often shared only internally or with donor agencies. Much of the research has only been presented to select audiences at professional meetings. The majority of reports have never been published or otherwise disseminated in any systematic or useful way to the global community, rendering access to this information a challenge. Decision-makers, health care managers, supervisors and providers, as well as academics and researchers in-

involved in either the design or implementation of programmes for HIV-related services need exposure to the collective knowledge gained through this experience.

This compilation aimed to contribute to efforts to update the 1998 international guidelines on HIV and infant feeding and to guide future efforts to adapt the revised guidelines to local settings. Although not a replacement for formative studies in specific cultural contexts, this report highlights pertinent issues that should be useful to those faced with the challenges of introducing or scaling up pMTCT-related programmes. The editorial team hopes that this effort to gather and share experiences will stimulate greater communication between the scientific, academic, public health, private sector, and donor communities on both a regional and global scale, and that it will result in more concerted efforts to collect data, document results, and disseminate HIV and infant feeding-related experience in the future.

## GENERAL BACKGROUND ON MOTHER-TO-CHILD TRANSMISSION

The overwhelming source of HIV infection in young children is mother-to-child transmission (MTCT) of the virus, with an estimated risk of 5–10% during pregnancy, 10–20% during labour and delivery, and 5–20% through breastfeeding.<sup>3</sup> Comparing data from currently available studies, breastfeeding may be responsible for as much as one third to one half of all HIV infections in infants and young children in African settings. Although very few reports provide detailed information on the mode (or quality) and

duration of breastfeeding, recent studies suggest that exclusive breastfeeding during the first months of life may be associated with a lower risk of HIV transmission than mixed feeding.<sup>4</sup> More research is currently in progress to clarify this issue.

Although the possibility of HIV transmission during breastfeeding has been firmly established, the exact mechanisms are still unknown. Central to the discussion of infant-feeding options, especially in resource poor settings, is the fact that the vast majority of infants breastfed by HIV-positive mothers do not become infected despite consuming a half million HIV virions or more per day.<sup>5</sup> The risk of HIV transmission continues, however, for as long as a child is breastfed. Another important consideration is the timing of the mother's infection. Among mothers infected while still breastfeeding, the risk of transmission through breast milk is nearly twice as high as for women infected before or during pregnancy.<sup>6</sup> This increased risk is due to the high viral load in a mother's system shortly after initial infection.

In addition to the duration and quality of breastfeeding and the timing of the mother's infection are several other factors shown to contribute to MTCT. These factors include the presence of systemic infections in the mother; the stage of progression of her HIV disease (measured by CD4 count, RNA viral load in plasma, or clinical symptoms); immune factors in breast milk; and infant morbidity, including intestinal lesions and oral thrush. The mother's breast health (e.g., subclinical or clinical mastitis, cracked or bleeding nipples, or breast abscess) has also been identified as a contributor to MTCT, with an estimated 18–20% of overall postnatal

## Box 1

### Terms Used Frequently in this Report<sup>†</sup>

**Acquired immunodeficiency syndrome (AIDS):** the active pathological condition that follows the earlier, non-symptomatic state of being HIV-positive.

**Artificial feeding:** feeding with breast-milk substitutes.

**Bottle feeding:** feeding from a bottle, whatever its content, which may be expressed breast milk, water, formula, or another liquid.

**\*Breast-milk feeding:** feeding breast milk to an infant, whether expressed or directly from the breast. Breast-milk feeding options in the context of HIV/AIDS include wet-nursing, expressing and heat-treating breast milk, and the use of breast-milk banks.

**Breast-milk substitute:** any food used as a partial or total replacement for breast milk, whether or not suitable for that purpose.

**\*Cessation of breastfeeding:** completely stopping breastfeeding, including suckling.

**Commercial infant formula:** a breast-milk substitute formulated commercially in accordance with applicable Codex Alimentarius standards to satisfy the nutritional requirements of infants during the first months of life up to the introduction of complementary foods.

**Complementary feeding:** the practice of giving complementary foods.

**Complementary food:** any food, whether manufactured or locally prepared, suitable as a complement to or substitute for breast milk.

<sup>†</sup> Most of these terms were derived from the 2003 revised WHO, UNICEF, UNFPA and UNAIDS. HIV and Infant Feeding: Guidelines for Decision-Makers (Geneva, 2003). Terms preceded with an asterisk (\*) were derived from other sources.

*continued on page 3*

transmission attributable to sub-clinical and clinical mastitis.<sup>7</sup> These breast conditions are of interest because they can often be prevented by counselling and by support for improved breastfeeding techniques and related practises. Proper infant attachment to the breast, for example, prevents nipple damage, and frequent and exclusive breastfeeding maintains milk production and prevents milk stasis and inflammation. Lactation management and immediate treatment of breast-related problems are considered important for HIV-positive mothers who choose to breastfeed. Immediate postpartum counselling has been shown to reduce the risk of a mother's breast inflammation and mastitis during her child's first weeks.<sup>8</sup>

## THE UNITED NATIONS' STRATEGIC APPROACH TO THE REDUCTION OF MTCT

The United Nations' (UN) current strategic approach to prevention of transmission of HIV in pregnant women, mothers, and their children encourages activities in four areas: 1) prevention of HIV infection in general, especially in young and/or pregnant women; 2) prevention of unintended pregnancies among HIV-infected women; 3) prevention of HIV transmission from infected women to their infants; and 4) provision of care, treatment, and support to HIV-infected women, their infants, and families.<sup>9</sup> Each of these activities highlights the critical role of women in preventing the spread of HIV.

In October 2000, WHO convened a Technical Consultation on behalf of the Inter-Agency Task Team on prevention of HIV transmission to pregnant women, mothers, and their children. The objective was to review recent scientific data and related policy implications and to update recommendations on the provision of anti-

retroviral (ARV) prophylaxis and infant-feeding counselling. The results amplified the recommendations contained in the 1997 WHO, UNICEF, and UNAIDS Joint Policy Statement on HIV and Infant Feeding, which reiterated the substantial benefits that breastfeeding provides in the general population while promoting fully informed choice of infant feeding methods by HIV-positive women.

Given the need to minimize the risk MTCT to infants while avoiding increasing the risk of other morbidity and mortality, WHO, UNAIDS, and UNICEF issued the following recommendation:

*For mothers who are HIV negative, or who do not know their HIV status, exclusive breastfeeding for the first 6 months and continued breastfeeding for up to 2 years or longer with the addition of complementary food after 6 months is recommended. If, however, a woman has tested positive for HIV, and when replacement feeding is acceptable, feasible, affordable, sustainable, and safe, avoidance of all breastfeeding by HIV positive mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first months of life. To minimize HIV transmission risk, breastfeeding should be discontinued as soon as feasible, taking into account local circumstances, the individual woman's situation and the risks of replacement feeding (including infections other than HIV and malnutrition).*

The UN recommendations further state that HIV-positive mothers should be counselled on the advantages and disadvantages of infant-feeding options and should be assisted in selecting the best option. Emphasis is placed on the fact that it is the mother who makes the final 'informed' choice on how to feed her child and that she should be supported in whatever she chooses. Also,

'when HIV-infected mothers choose not to breastfeed from birth or stop breastfeeding later, they should be provided with specific guidance and support for at least the first two years of the child's life to ensure adequate replacement feeding.' It should be recognised, however, that in many cases the mother is seeking advice from someone she is consulting for her health. Very often she may, not surprisingly, ask the counsellor what feeding method he or she would use under her circumstances.

After the Technical Consultation, a Global Strategy for Infant and Young Child Feeding (IYCF)<sup>10</sup> was adopted by the World Health Assembly and UNICEF's Executive Board in 2002. The Global Strategy reiterates that the optimal feeding pattern for overall survival in the general population is exclusive breastfeeding for the first six months and continued breastfeeding for up to two years and beyond with complementary feeding from age six months, and related maternal nutrition and support. However, the Global Strategy also takes into account children in exceptionally difficult circumstances, including those born to HIV-positive women.

It was in the context of the Global Strategy for IYCF that the joint United Nations HIV and Infant Feeding Framework for Priority Action was developed. The framework proposes a number of priority actions related to HIV and infant feeding to be considered by governments, including the provision of adequate support to HIV-positive women to enable them to select the best feeding option for themselves and their babies and to successfully carry out their infant-feeding decisions

## THE ROLE OF THIS COMPILATION IN UPDATING THE GLOBAL GUIDELINES

As underscored by Stephen Lewis, Special Representative to the UN Secretary General on HIV/AIDS in Africa, during his keynote address at the 2002 Colloquium on HIV and Infant Feeding, sponsored by the World Alliance for Breastfeeding Action (WABA) and UNICEF,<sup>11</sup> research on breastfeeding and replacement feeding is critical and must continue. An ongoing investment in research is especially important, Lewis said, to assess strategies that can substantially reduce the risk of HIV transmission during breastfeeding in the first months of life, with emphasis on the relative risks of infant-feeding options in resource poor settings. During the colloquium and the WABA conference that followed, interest was expressed in reviewing relevant programme experience related to HIV and infant feeding as well as the medical and scientific evidence. In response to this interest and as a contribution to the process of updating the 1998 international guidelines, URC/QAP and UNICEF entered into a collaboration in November 2002 to prepare this compilation of programme experience, most of which had never been published or disseminated in any form.

In February 2003, WHO convened a second technical consultation of subject experts, field project personnel, and programme managers from Africa, Asia, Eastern Europe, and Latin America to review initial drafts of the revised guidelines in light of the latest available medical and scientific evidence and a review of programmatic experience, derived, to a large extent, from a draft of this compilation. The resulting guidelines were refined and tested following the February consultation, with additional review, technical inputs, and field testing, before being formally launched at the International Conference

*Box 1 continued*

**Cup feeding:** using an open cup, irrespective of its contents, to feed.

**\*Early cessation of breastfeeding:** stopping breastfeeding, including suckling prior to, at, or about six months of age, as soon as replacement feeding is acceptable, feasible, affordable, sustainable, and safe, with the idea of avoiding mixed feeding to the greatest extent possible.

**\*Exclusive breastfeeding:** giving an infant no food or drink, not even water, other than breast milk, except for drops or syrups of vitamins, mineral supplements, or medicines.

**Human immunodeficiency virus (HIV):** the virus that causes AIDS. In this document, the term HIV means HIV-1. Mother-to-child transmission of HIV-2 is rare.

**HIV-negative:** refers to adults who have taken an HIV test and who know that they tested negative and to young children who have tested negative and whose parents or guardians know the results.

**HIV-positive:** refers to adults who have taken an HIV test and who know that they tested positive and to young children who have tested positive and whose parents or guardians know the results.

**HIV status unknown:** refers to people who either have not taken an HIV test or do not know the result of a test they have taken.

**HIV-infected:** refers to a people who are infected with HIV, whether or not they are aware of it.

**HIV testing and counselling:** testing for HIV status, preceded and followed by counselling. Testing should be voluntary and confidential, with fully informed consent. The expression encompasses the following terms: *counselling and voluntary testing*, *voluntary counselling and testing*, and *voluntary and confidential counselling and testing*. Counselling is a process,

*continued on page 4*

*Box 1 continued*

not a one-time event: For the HIV-positive client it should include life planning, and, if the client is pregnant or has recently given birth, it should include infant-feeding considerations.

**\*Home-prepared formula:** a breast-milk substitute prepared at home from fresh or processed animal milks, suitably diluted with water and with the addition of sugar and micronutrients.

**Infant:** a child from birth to 12 months of age.

**Infant feeding counselling:** counselling on breastfeeding, complementary feeding, and, for HIV-positive women, HIV and infant feeding.

**\*Mixed feeding:** feeding both breast milk and other foods or liquids.

**Mother-to-child transmission (MTCT):** transmission of HIV to a child from an HIV-infected woman during pregnancy, delivery, or breastfeeding. The term is used in this document because the immediate source of the child's HIV infection is the mother. The term implies no blame, whether or not a woman is aware of her own infection status. A woman can acquire HIV from unprotected sex with an infected partner, contaminated blood, non-sterile instruments (as is the case of injecting drug users), or contaminated medical procedures.

**\*Predominant breastfeeding:** the infant mostly receives breast milk but also occasionally receives other liquids, including water and/or tastes (small amounts) of ritual or other foods.

**Programme:** an organised set of activities designed to prevent transmission of HIV from mothers to their infants.

**\*Replacement feeding:** feeding an infant who is receiving no breast milk a diet that provides all the nutrients the infant needs until the age when he/she can be fully fed on

*continued on page 5*

on AIDS and Sexually Transmitted Illnesses in Africa (ICASA), in September 2003 in Nairobi, Kenya.<sup>12</sup>

The difficulty in providing clear global guidance related to HIV and infant feeding is highlighted by the revised guidelines. There are no simple answers to the interdependent and complex questions surrounding how best to feed infants born to HIV-positive women. As those guidelines state, programme planners and managers need to be fully aware of the population benefits and risks of all infant-feeding options. They must 'take into account the global goals and approaches related to the prevention of HIV infection in infants and young children, and apply them as appropriate in programme planning and implementation, keeping in mind that the ultimate objective is to reduce overall infant and young child morbidity and mortality in the general population and specifically in the HIV-infected population'.

## METHODOLOGY

This compilation represents the first attempt of its kind to systematically collect and synthesise a wide range of global programme experiences related to HIV and infant feeding. A description of the process follows.

**COMPILATION:** *The compilation process included the following steps:*

- UNICEF and WHO provided a large number of documents and abstracts, many of which had previously been identified in the development of a CD-ROM by the UNICEF Eastern and Southern African Regional Office (ESARO) in 2001,<sup>13</sup>
- UNICEF and WHO provided lists of key informants (researchers, programme

directors, programme evaluators, trainers, and policy makers),

- QAP conducted a worldwide web (www) search on pMTCT and infant feeding programmes,
- A request for documents and information was circulated to key informants and a number of United Nations (UN) and USAID-related listservs by UNICEF, WHO, USAID, and QAP,
- Authors of documents collected earlier by ESARO for their HIV and infant-feeding CD-ROM were contacted for updated reports.

The source materials for this compilation were selected from over 100 documents from more than 20 countries and included formative research and baseline studies, programme evaluations and rapid assessments, graduate theses, a few published papers, expert meeting reports, conference abstracts, 'lessons learned' documents, national policies and guidelines, counselling and educational materials, and interviews with key informants and authors. Excluded were peer reviewed literature related to medical/clinical research studies and pharmaceutical trials. Most reports were generated by pMTCT pilot programmes and research sites in Africa. Very few were identified from Asia, only one from Latin America, and none from Eastern Europe. Not all of the source materials are polished reports, nor do they all reflect the application of rigorous scientific methods. Of the 45 reports ultimately selected, most are fairly current and focused on programmes initiated during the last three to five years. They represent real programme experience, involving real-life situations. Reports of secondary data analysis, conference proceedings, editorial articles, background articles, and abstracts or project reports that presented insufficient data or analysis were excluded.



**SUMMARISATION:** *Individual two- to four-page summaries were developed for each of the selected reports:*

The information highlighted in each summary was guided by a number of questions, issues, and themes. Where several documents report findings from the same project or programme, an overall summary was prepared, combining information, where possible, to facilitate synthesis and discussion. Most of the summaries have been checked by the authors of the source documents. Summaries were standardised to include:

- A short background description of the project or intervention;
- A summary of the methodology used;
- Major reported results, conclusions, and recommendations made by the authors; and
- A statement concerning methodological considerations, including comments made by the reviewer.

Each summary has been indexed using pre-defined index terms to facilitate the identification of materials of specific interest to the individual reader.

**SYNTHESIS:** *The experience compiled and summarised was organised under several key issues and themes:*

The WABA-UNICEF colloquium mentioned above and other technical gatherings influenced the development of these issues and themes, which were prioritised based on their relevance to the technical review and updating of the global HIV and infant feeding guidelines. Experiences related to the acceptability, feasibility, affordability, sustainability, and safety (AFASS) of infant feeding practises or options were included whenever possible.

## CLARIFICATIONS

This document brings together the experiences of a wide range of organisations and individuals, reflecting various levels of sophistication. The editorial team did not try to distinguish between correct and incorrect programme strategies. Although the summaries often include an editor's note on the strengths and weaknesses of the research methodology, no attempt has been made to provide a sys-

### *Box 1 continued*

family foods. During the first six months, replacement feeding should be with a suitable breast-milk substitute. After six months, the substitute should be complemented with other foods.

**\*Spillover:** a term used to designate the infant-feeding behaviour of new mothers (who either know that they are HIV-negative or are unaware of their HIV status) who do not breastfeed, breastfeed for a short time only, or mix feed because of unfounded fears of HIV, misinformation, or the ready availability of breast-milk substitutes.

tematic critique of each programme or weigh the relative strengths of evidence. Each summary presents the major programme results, as well as the key conclusions and recommendations of individual authors. The document does not provide overall recommendations and, except where noted, makes every attempt to present the information from the selected reports and not our own opinions.



## Box 2:

### Definitions of Acceptable, Feasible, Affordable, Sustainable, and Safe (AFASS)

The WHO-convened technical consultation in 2000 specified that when replacement feeding is acceptable, feasible, affordable, sustainable, and safe (AFASS), all breastfeeding by HIV-infected mothers should be avoided. For a woman who begins exclusive breastfeeding, the same recommendation would apply when she decides whether or not, and at what age, to practice replacement feeding.

The following definitions for each of the AFASS terms were included in the revised WHO, UNICEF, UNFPA, and UNAIDS *HIV and Infant Feeding: Guidelines for Decision-Makers*. They were developed to provide guidance, with the understanding that they should be adapted locally based on formative research.

**Acceptable:** The mother perceives no barrier to replacement feeding. Barriers may include cultural or social reasons or be caused by fear of stigma or discrimination. According to this concept, the mother is under no social or cultural pressure not to use replacement feeding, and she is supported by family and community in opting for replacement feeding, or she will be able to cope with pressure from family and friends to breastfeed, and she can deal with any stigma attached to being seen with replacement food.

**Feasible:** The mother (or family) has adequate time, knowledge, skills, and other resources to prepare the replacement food and feed the infant up to 12 times in 24 hours. According to this concept, the mother can understand and follow the instructions for preparing replacement feeds and with support from the family can prepare enough replacement feeds correctly every day and at night, despite disruptions to preparation of family food or other work.

*continued on page 7*

## SYNTHESIS OF MAJOR FINDINGS BY KEY THEMES

This synthesis organises some of the major findings of the reports included in this compilation by key themes that emerged during the compilation and summarisation process. Note that this synthesis is limited to the review of programme experience presented in the documents thus far collected, the vast majority of which have never been published and/or subjected to peer review or other technical scrutiny. (This category of documentation is sometimes referred to as 'grey literature'.) Although every attempt was made to identify documents from all regions of the world, most of the documents represent programme experience from Africa. Several are from Asia; one is from Latin America; and none is from Eastern Europe or the Western Hemisphere. The experiences highlighted below and in the document summaries that follow vary tremendously in scale and levels of sophistication, rendering impossible the weighing of evidence or comparing of results. Although some of the findings are quantitative, most are based on qualitative research and are subjective in nature. Readers are encouraged to review the original source documents for additional details and further insights.<sup>14</sup>

### REPLACEMENT FEEDING

**Definition:** *feeding an infant who is receiving no breast milk a diet that provides all the nutrients the infant needs until the age at which he/she can be fully fed on family foods. During the first six months, replacement feeding should be with a suitable breast-milk substitute. After six months, the suitable substitute should be complemented with other foods.*<sup>15</sup>

The 2000 WHO Technical Consultation recommended that HIV-positive mothers avoid all breastfeeding when replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS). There are two major types of replacement feeding: commercial infant formula and home-prepared formula. For the latter, animal milk is diluted with water and sugar is added. In this case it is essential that the child also receive a micronutrient supplement. Generally speaking, commercial infant formula is only available in powdered form so water has to be added. Ready-to-use commercial infant formula is not commonly available in the studied countries.

### Uptake and rates of replacement feeding

**HIV-unknown status.** The reviewed studies that addressed this issue indicate that mothers who do not know their HIV status rarely plan to replacement feed from birth or actually do so. In Botswana, only 9% (16 of 186) of pregnant women who did not know their HIV status planned to replacement feed from birth, and when interviewed up to 6 months after birth, 14 of those mothers were actually doing so (pMTCT Advisory Group, 2001).<sup>16</sup> In Tanzania, all 500 respondents in a study of women attending antenatal clinics who did not know their HIV status expressed a strong desire to breastfeed and not replacement feed (de Paoli et al, 2000). In Thailand, 83% of pregnant women who did not know their HIV status planned to breastfeed and not formula feed (Talawat et al, 2002).

**HIV-positive status.** Women who know they are HIV-positive are much more likely to plan to replacement feed, and they succeed in replacement feeding more often

than women who do not know their HIV status, although the choice and successful practise of replacement feeding varies greatly between and even within countries. Many antenatal women in pMTCT programs change their minds about infant feeding when they learn they are HIV-positive, switching from intending to breastfeed to intending to replacement feed. In Botswana, 89% (141 of 158) of women who knew they were HIV-positive planned to replacement feed, and when interviewed up to 6 months after birth, 139 of those mothers were doing so (pMTCT Advisory Group, 2001). Another Botswana study, however, concluded that adherence to replacement feeding was poor in spite of intense follow-up (Shapiro et al, 2003).

In Cote d'Ivoire where free formula was provided, 59% (151 of 255) of HIV-positive women planned to replacement feed before delivery and 81% (123 of 151) of those who so planned were doing so two days after birth (Leroy et al, 2002). A rapid assessment of a Honduran pilot project that gives free formula to HIV-positive mothers found that all 30 HIV-positive women interviewed planned to replacement feed (Baek et al, 2002). In South Africa, a study of HIV-positive pregnant women found that only 9% (18 of 189) planned to replacement feed, but 12 of the 18 were still doing so at the end of the first week after birth (Rollins et al, 2002). Another South Africa study reported that when mothers learned they were HIV-positive, they stopped breastfeeding immediately (Seidel et al, 2000). In Thailand, 94% (75 of 80) of HIV-positive mothers were replacement feeding at the time of interview, even though most had not planned to replacement feed before learning they were HIV-positive (Talawat et al, 2002). In a Uganda study of a pMTCT programme providing free formula, 43% (375 of 870) of HIV-positive pregnant women planned to replacement feed, while the other 57%

planned to exclusively breastfeed. Of the 279 HIV-positive mothers in the study who initially accepted free formula, 78 never returned for more formula, and 47 returned but later defaulted (Matovu et al, 2002). In Zimbabwe, 17% (32 of 188) of HIV-positive mothers of children up to 20 months in a pMTCT programme reported to counsellors they were replacement feeding successfully so far (Chitsike, circa 2000). One South African study indicates that the uptake and rate of replacement feeding is higher in urban areas than rural ones (McCoy et al, 2002).

### Factors that influence the selection and successful practise of replacement feeding by HIV-positive mothers

*Discovering one's HIV-positive status.* The above evidence indicates that the selection and practise of replacement feeding is much more prevalent in HIV-positive women than in HIV-unknown women. This evidence indicates that when antenatal women first learn they are HIV-positive, many state that they intend to replacement feed instead of breastfeed. A study in Thailand specifically documented this change of mind (Talawat et al, 2002). The studies reviewed, however, do not help us understand how long women are able to sustain exclusive replacement feeding.

*Free or subsidised formula.* Several studies indicate that the distribution of free formula or subsidisation of formula by research projects or government programs persuades some HIV-positive women to replacement feed (in Honduras: Baek et al, 2002; in South Africa: McCoy et al, 2002; in Tanzania: de Paoli et al, 2000; and in Uganda: Matovu et al, 2002). However, evidence from the Uganda study suggests that availability of free formula does not always ensure that the decision to replacement feed translates into successful prac-

#### Box 2 continued

**Affordable:** The mother and family, with community or health system support if necessary, can pay for the cost of purchasing/producing, preparing, and using replacement feeding, including all ingredients, fuel, clean water, soap, and equipment, without compromising the health and nutrition of the family. This concept also includes access to medical care if necessary for diarrhoea and other illnesses and the cost of such care.

**Sustainable:** Availability of a continuous and uninterrupted supply and dependable system of distribution for all ingredients and products needed for safe replacement feeding for as long as the infant needs it, up to one year of age or longer. According to this concept, there is little risk that the replacement food will ever be unavailable or inaccessible. It also means that another person, who can prepare and give replacement feeds, will always be available to feed the child in the mother's absence.

**Safe:** Replacement foods are correctly and hygienically prepared and stored and fed in nutritionally adequate quantities with clean hands and clean utensils, preferably by cup. This concept means that the mother or caregiver:

- Has access to a reliable supply of safe water (from a piped or protected well source),
- Prepares replacement feeds that are nutritionally sound and free of pathogens,
- Is able to wash hands and utensils thoroughly with soap and to regularly boil the utensils to sterilise them,
- Can boil water for at least 10 minutes to prepare each of the baby's feeds, and
- Can store unprepared feeds in clean, covered containers and protect them from rodents, insects, and other animals.

### Box 3:

#### Summary of Feeding Options for Infants of HIV-Positive Mothers: International Guidelines, 2003\*

The following infant feeding options for HIV-positive mothers are included in the updated 2003 international HIV and infant feeding guidelines:

##### Replacement feeding (RF) for the child aged 0-6 months

- Commercial infant formula
- Home-modified animal milk

(Properly modified fresh animal's milk, powdered full-cream, and evaporated milks are recommended. Unsuitable replacement feeds include unmodified animal's milk, skimmed and sweetened condensed milk, fruit juices, sugar-water and dilute cereal gruels. Mixed feeding—combining breast milk and other foods or liquids—is never recommended.)

##### Exclusive breastfeeding (EBF) for children aged 0-6 months

- Exclusive breastfeeding between 0-6 months
- Early cessation of breastfeeding (occurring over a few days to a few weeks)
- Transition from exclusive breastfeeding to replacement feeding

##### Breast-milk feeding

- Wet-nursing
- Expressing and heat-treating breast milk
- Breast-milk banks

##### Feeding from 6 months to 2 years

- All children need suitable complementary foods from the age of 6 months
- Non-breastfed infants and young children from 6 months of age should ideally continue to receive a suitable breast-milk substitute as well as complementary

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tise, and such availability may lead to increased mixed feeding (Matovu et al, 2002). In fact, many of the documents reviewed note that the high cost of replacement feeding, including the cost to clean utensils, heat the milk, and buy formula, deters low-income women from selecting or successfully practising replacement feeding. In most of the countries studied, commercial infant formula (and often even animal milk) are just too expensive. In the opinion of many, this high cost is the primary factor in preventing many mothers from successfully replacement feeding (in India: Sarna, 2002; in Myanmar: Williams et al, 2003; in South Africa: Chopra et al, 2003 and Seidel et al, 2000; in Zambia: Hope Humana et al, 2002). The cost to national programmes of supplying free infant formula to HIV-positive mothers has also led to decisions by some governments not to provide free or subsidised formula or to discontinue this component of pMTCT programmes (in Honduras: Baek et al, 2002; in Zambia: Kankasa et al, 2002; in Rwanda: Pham et al, 2002; in India: Sarna, 2002).

*Advice from counsellors or health workers.* The evidence indicates that in many settings mothers desire and adhere to the advice of health workers regarding infant feeding (in Nigeria: Isiramen, 2002; in South Africa: Bentley et al, 2002 and Rollins et al, 2002; in Zambia: the Ndola Demonstration Project, NDHMT, 1999, Bond and Ndubani 1999; in multiple countries: Rutenberg et al, 2002). However, one study found significant dissonance of mothers towards advice of doctors to replacement feeding in a breastfeeding culture (In India: South India AIDS Action Programme et al, 2001). Sometimes guidance by counsellors or programme policy shows a clear bias towards one feeding option or another and rarely reflects balanced counselling that includes risk assessment (in Zambia: Kankasa et al, 2002). In the reviewed studies, bias was most often in favour of replacement feeding and/or against exclu-

sive breastfeeding for HIV-positive mothers (in Honduras: Baek et al, 2002; in India: the South India AIDS Action Programme et al, 2001; in Rwanda: Pham et al, 2002; in South Africa: Chopra et al, 2000 and Seidel et al, 2000; in Tanzania: de Paoli et al, 2002; in Zambia: Kankasa et al, 2002). But some counsellors and programmes were biased in favour of exclusive breastfeeding and/or against replacement feeding (in India: Sarna, 2002; in South Africa (rural hospitals): McCoy et al, 2002).

*Partner or family involvement.* A study in Cote d'Ivoire found that women living with a partner were less likely to choose replacement feeding than those not, and failures to comply if they did choose replacement feeding were mainly related to the family environment (Leroy et al, 2002). A study in Uganda found that women who succeeded in replacement feeding had family support (Matovu et al, 2002). Several studies note that partners and family have influence over feeding decisions (in Botswana: Tlou et al, 2000; in South Africa: Seidel et al, 2000; in Tanzania: Swartzendruber et al, 2002; in Uganda: Hope Humana et al, 2002; in Zambia: Kankasa et al, 2002).

*Mother's fear of transmitting HIV to their infants.* Some mothers believe all babies of HIV-positive mothers will be infected, and some completely avoid breastfeeding to reduce the risk (in South Africa: Rollins et al, 2002 and Seidel et al, 2000; in Tanzania: de Paoli et al, 2000).

*Mother's educational level.* Two studies indicated that better-educated women were more successful with replacement feeding than less-educated women (in Cote d'Ivoire: Leroy et al, 2002; in Uganda: Matovu et al, 2002). Respondents in another study concurred, stating their opinion that more-educated women are more successful at replacement feeding (in Tanzania: de Paoli et al, 2002). No other reviewed studies analysed this issue.

*Mother as primary income provider.* One study found that mothers who are the primary income providers are more likely to replacement feed than women who are not (in South Africa: Rollins et al, 2002).

*Mother's participation in a structured pMTCT programme.* The programmes reviewed suggest that a higher proportion of HIV-positive mothers select replacement feeding and then practice it more successfully if they participate in a structured pMTCT programme, although this result is highly confounded by the several factors that typically comprise a pMTCT programme, such as testing, free formula, counselling (sometimes biased), and follow-up (in Botswana: pMTCT Advisory Group, 2001; in Honduras: Baek et al, 2002; in Zambia: Kankasa et al, 2002). However, a pMTCT programme in India that promoted informed choice among HIV-positive women reported the opposite effect: exclusive breastfeeding and not replacement feeding increased in HIV-positive mothers (Sarna, 2002).

### Spillover of commercial infant formula

**Definition:** *a term used to designate the feeding behaviour of new mothers (who either know that they are HIV-negative or are unaware of their HIV status) who do not breastfeed, breastfeed for a short time only, or mix feed, because of unfounded fears about HIV, misinformation, or the ready availability of breast-milk substitutes.*

Two of the studies reviewed here specifically attempted to measure or address spillover (in Botswana: pMTCT Advisory Group, 2001; in Honduras: Baek et al, 2002). Several others mentioned concerns and the need to monitor the use of infant formula among HIV-negative and unknown-status women. The Botswana study reported a

substantial spillover effect: In the non-programme group, 37% of all mothers, regardless of HIV status, practised exclusive breastfeeding, compared to only 16% in the programme group, with the difference of 21 percentage points ascribed to spillover. But in Honduras, where bottle-feeding is widely accepted, no spillover was reported. The pMTCT programme there encourages HIV-negative women to exclusively breastfeed, and the evaluation reported that the programme encountered no HIV-negative or HIV-unknown mothers using commercial formula due to spillover.

### Home-prepared formula

**Definition:** *a breast-milk substitute prepared at home from fresh or processed animal milks, suitably diluted with water and with the addition of sugar and micro-nutrients.*

Only one study among those reviewed explicitly focused on the use of home-prepared formula, although several others examined the use of animal milks as an option to commercial infant formula for replacement feeding. In the India pMTCT programme, modified cow and buffalo milk is the only recommended alternative to breastfeeding. Formula is considered too expensive and therefore is not recommended (Sarna, 2002). Two studies that interviewed mothers in Kenya and Tanzania suggest that cow's milk can be an acceptable option for HIV-positive mothers. In Kenya, cow's milk was considered the best alternative if breastfeeding was not possible, but only for those who owned a cow, making milk affordable (Oguta et al, 2001). In this study, other alternatives, such as the use of infant formula, wet nursing, expression of breast milk, and goat's milk, were considered less desirable than cow's milk. In Tanzania, all alternatives to breastfeeding were considered too expen-

#### Box 3 continued

foods made from properly prepared and nutrient-enriched family foods.

- When milk is part of the diet, complementary foods are needed 2-3 times a day at 6-8 months of age, and 3-4 times a day from 9 up to 24 months of age, with additional nutritious snacks offered once or twice a day.
- The general principles of complementary feeding are the same for a child receiving a milk source, such as commercial infant formula or animal milk, as for a child being breastfed.
- Where no suitable breast-milk substitute is available after 6 months, replacement feeding should be with properly prepared, and enriched family foods given more frequently.
- Other milk products, such as boiled animal's milk or yoghurt, should be included as a source of protein and calcium; other animal products such as eggs, meat, liver, and fish should be given as a source of iron and zinc; and fruit and vegetables should be given to provide vitamins, especially vitamins A and C.
- Micronutrient supplements are needed, especially iron, according to WHO\*\* or national guideline.

\* Summary of infant-feeding options derived from the 2003 revised WHO, UNICEF, UNFPA and UNAIDS. *HIV and Infant Feeding: Guidelines for Decision-Makers* (Geneva, 2003).

\*\* Vitamin A: 50,000 IU before 6 months and 100,000 IU between 6 and 12 months (with a minimum of a 1-month interval); from 12 months on: 200,000 IU every 4 to 6 months. Iron: where the diet does not include foods fortified with iron or where anaemia prevalence is about 40%, 2mg/kg body weight/day of iron from 6 months of age up to 23 months of age.



sive, but cow's milk was thought to be the best option (de Paoli et al, 2000). However, a Myanmar study found that although cow and goat milk may be acceptable options to breastfeeding for some HIV-positive mothers, many families thought that modified animal milk was too expensive and too complicated to prepare several times a day (Williams, 2003).

## EXCLUSIVE BREASTFEEDING

**Definition of exclusive breastfeeding:** *giving an infant no food or drink, not even water, other than breast milk except for drops or syrups of vitamins, mineral supplements, or medicines.*

**Definition of predominant breastfeeding:** *the infant mostly receives breast milk but is also occasionally given other liquids, including water and/or tastes (or small amounts) of ritual or other foods.*

**Definition of breast-milk feeding:** *feeding breast milk to an infant, whether expressed or directly from the breast. Breast-milk feeding options in the context of HIV/AIDS include wet-nursing, expressing and heat-treating breast milk, and the use of breast-milk banks.*

**Definition of mixed feeding:** *feeding both breast milk and other foods or liquids.*

### Prevalence of exclusive breastfeeding

*Low prevalence and short duration of exclusive breastfeeding.* Rates and duration of exclusive breastfeeding are relatively low/brief, regardless of the HIV status of mothers. In Botswana, self-reported exclusive breastfeeding since birth in a sample of mothers of infants aged 0–6 months was 33.7% in the control group (of unknown-HIV status to the study team), while in the

programme group exclusive breastfeeding was reported by 2.7% of the HIV-positive mothers and 18.4% of the HIV-negative ones (pMTCT Advisory Group, 2001). In Myanmar, a survey of mothers of unknown HIV status (to the study team) concluded that although the idea of exclusive breastfeeding was acceptable, convenient, less time-consuming, and less expensive, the practice of exclusive breastfeeding was uncommon, with two-thirds of the infants receiving water (to quench thirst) by 2 to 3 months of age (Williams et al, 2003). In another Myanmar study, document review and key informant interviews found evidence of low exclusive breastfeeding (16% of infants 0–3 months) largely due to giving of water, although pre-lacteal feeding, a traditional practice, was unusual (Williams, 2001). In Nigeria, mothers of any HIV status reported the following for infants aged 4–6 months: 33% reported exclusive breastfeeding; 48% reported predominant breastfeeding (defined as giving other liquids before one month of age); and 19% reported mixed feeding (Isiramen, 2002). Interviews with a random sample of South African mothers of any HIV status found that half reported introducing infant formula before one month and most before three months, and those who continued exclusive breastfeeding did so because they could not afford other milks (Chopra et al, 2000). A survey of HIV-positive mothers in Zimbabwe reported that exclusive breastfeeding was practised by 84% at one week; 75% at 1 month; 40% at 3 months; and none by the 6th month (Chitsike, 2000).

Some Nigerian mothers said exclusive breastfeeding for 3 months is more practical than for 6 months (Isiramen, 2002). Exclusive breastfeeding was difficult to achieve beyond the first weeks of life for Cote D'Ivoire mothers (Leroy et al, 2002). In Botswana, 10% (3 of 31) of a random sample of mothers who had agreed to exclusively breastfeed were still doing so by

3 months and none by 5 months (Shapiro et al, 2003).

*Exclusive breastfeeding can be increased.* Evidence shows that the prevalence of exclusive breastfeeding in the first 6 months of life can be increased. Following the introduction of a programme to promote exclusive breastfeeding in South Africa, formula use in the first 24 hours of life decreased significantly at the intervention site (30% to 0%), while increasing at the control site (5% to 15%); and exclusive breastfeeding for infants aged 0–6 months increased significantly in the intervention area (13.9% to 21.5%), but did not change in the control area (Bentley et al, 2002). Consecutive surveys in Zambia between 2000 and 2002 show that prevalence and duration of exclusive breastfeeding increased with counselling during ANC visits and post HIV-testing (AED/Linkages, 2002). In Zimbabwe, the rate of exclusive breastfeeding since birth, as reported by mothers of all HIV-status at 3 months after birth, was directly related to the intensity of the intervention: Exclusive breastfeeding was only 2% in the pre-intervention cohort but rose to 9% in the post-intervention cohort with education but no individual counselling and to 19% in the post-intervention cohort with both education and individual counselling (Tavengwa et al, 2002).

### Factors associated with increased exclusive breastfeeding

Programmatic experience underscores that several important factors are associated with a woman's ability to achieve exclusive breastfeeding:

*Support and promotion of breastfeeding.* Exclusive breastfeeding was higher in a programme group in South Africa that included (1) trained lay counselling in clinics and home visits and (2) general commu-

nity breastfeeding promotion with posters, pamphlets, and newspaper articles (Bentley et al, 2002). In Tanzania, pregnant women of unknown HIV status who had more knowledge about breastfeeding said they were more likely to exclusively breastfeed (de Paoli et al, 2002).

*Cost and income.* Several studies note that mothers practised exclusive breastfeeding because they could not afford the alternatives. A sample of South African mothers of unknown HIV status said they practised exclusive breastfeeding by default because they could not afford other milks (Chopra et al, 2000). Several mothers in India said they decided to breastfeed because they did not have the means to boil water or sterilise utensils, or could not afford cow's milk (Sarna, 2002).

*BFHI.* Giving birth in a 'baby-friendly hospital' was associated with higher exclusive breastfeeding rates in Botswana (anecdotal evidence from Rollins, 2003; pMTCT Advisory Group, 2001). Mothers in Nigeria were more responsive to BFHI-designated messages from hospitals (Isiramen, 2002).

*Stigma.* Stigma associated with not breastfeeding and pressure from others cause some women to choose exclusive breastfeeding over replacement feeding. Most women in a South African study who met all conditions for safe replacement feeding still chose exclusive breastfeeding (25 of 28), citing family expectations, stigma, and concerns about disclosure (Rollins et al, 2002). Sixteen HIV/AIDS counsellors interviewed in Tanzania said the fear of stigmatisation contributed to the decision to exclusively breastfeed (de Paoli et al, 2002).

*Family support.* Feeding histories from 309 Tanzanian mothers found being married was significantly associated with a longer duration of exclusive breastfeeding (de

Paoli et al, 2001). In Nigeria some mothers said that relatives made exclusive breastfeeding difficult (Isiramen, 2002).

*Education.* Mothers with more education were more likely to practise exclusive breastfeeding in Nigeria (Isiramen, 2002).

*HIV status.* A woman's HIV status combined with her knowledge of it affects whether or not she practises exclusive breastfeeding or replacement feeding. In Tanzania women who knew they were HIV-negative were more likely to choose and practise exclusive breastfeeding (de Paoli et al, 2001).

*Knowledge about benefits of exclusive breastfeeding.* Lack of knowledge about exclusive breastfeeding in mothers and some counsellors may have hindered the practise of exclusive breastfeeding in some cases but not others. Some Tanzanian counsellors lacked knowledge about exclusive breastfeeding and its benefits and did not believe exclusive breastfeeding was possible, while mother knowledge of the benefits of exclusive breastfeeding engendered more of it (de Paoli et al, 2002). In Thailand, mothers considered breastfeeding more advantageous than formula for several reasons, but HIV-positive mothers rated formula significantly safer than other feeding methods (Talawat et al, 2002).

## Cessation of breastfeeding and weaning<sup>17</sup> issues

**Definition of cessation of breastfeeding:** *completely stopping breastfeeding, including suckling.*

**Definition of early cessation:** *Stopping breastfeeding, including suckling, prior to, or at or about, six months of age, as soon as replacement feeding is acceptable, feasible, affordable, sustainable and safe, with the idea of avoiding mixed feeding to the extent possible.*

Two attributes are often associated with the cessation of breastfeeding for women who are exclusively breastfeeding: (1) the age of the infant when cessation occurs (timing) and (2) the period of transition from exclusive breastfeeding to no breastfeeding, during which time mixed feeding occurs. In the revised international guidelines, the term 'early cessation' is used to refer to the age at which the infant stops breastfeeding, including suckling: generally prior to or at or about six months. In the reports summarised here, however, 'early cessation' means less than one month old in some cases and as long as up to one year or more in others, especially in the African context where breastfeeding for two years or longer is common. Although currently not recommended, the term 'abrupt cessation' was used in several of the summarised documents to describe an abbreviated transition from exclusive breastfeeding to no breastfeeding. 'Abrupt' means from 2-3 days in some documents to as long as 2-3 weeks in others. Previously, it was commonly recommended that for HIV-positive women, the transition period should be as short as possible in order to reduce the period of mixed feeding and the associated higher risk of HIV infection. However, both early and abrupt cessation carry risks for mothers and infants and may raise family and/or community objections. Given these issues, both the timing and the period for transition are still under investigations and discussion.

*Early versus abrupt cessation.* Although the UN currently recommends early cessation of breastfeeding for HIV-positive mothers, only two programmes included here were designed to address the issue specifically: A Uganda study found that some HIV-positive mothers achieved 'abrupt' cessation while others did not (Bakaki, 2002), and a Nigeria study said that 'abrupt' cessation (defined as occurring over 1 to 2 weeks) was common, but



among women having older infants (Isiramen, 2002). Information from other studies reflects mixed findings. In Botswana, mothers who had stopped breastfeeding by the time of the interview had done so by gradually changing to other milks (pMTCT Advisory Group, 2001). In Myanmar, mothers thought that abrupt cessation was being achieved but was cruel to the baby (Williams et al, 2003). A Zambia study says that exclusive breastfeeding followed immediately by replacement feeding is contrary to community norms (Kankasa et al, 2002).

*Age of child at cessation.* Traditionally, among women of unknown or negative HIV-status, some breastfeeding continues for a long time (1–2 years) according to the studies reviewed here (in Botswana: Shapiro et al, 2003; in India: South India AIDS Action Programme et al, 2001; in Myanmar: Williams, 2003; in Nigeria: Isiramen, 2002; in Tanzania: de Paoli et al, 2001). For example, the Nigeria study reported that 81% of the mothers interviewed ceased breastfeeding at 12–18 months and 'early weaning' (under 10 months) was unusual (Isiramen, 2002). A Zimbabwe study notes that all HIV-positive mothers in a pilot pMTCT programme who chose exclusive breastfeeding ceased breastfeeding entirely by 6 months (Chitske, 2000).

*Positive factors associated with early cessation.* The results of the Uganda study suggest that early cessation by HIV-positive mothers who chose to exclusively breastfeed can be achieved (Bakaki, 2002). In this study, HIV-positive mothers who were enrolled in a pMTCT pilot programme and had successfully stopped breastfeeding before 7 months reported the factors that made them successful: education about MTCT, good counselling, early disclosure of HIV-status, and help from relatives and friends. Health workers in the Uganda

programme added single and working mothers and baby's negative HIV-status to this list.

*Negative factors associated with early cessation.* Many studies reported that early cessation had proven very difficult for HIV-positive mothers, sometimes even when a pMTCT programme was promoting it (in some parts of Asia: Preble and Piwoz, 2002; in Kenya: Oguta et al, 2001; in Myanmar: Williams et al, 2003; in Tanzania: Swartzendruber et al, 2002). Problems associated with early cessation identified or discussed in these studies included: the development of mastitis and breast abscesses in mothers; and distress, restlessness, loss of appetite, diarrhoea, and malnutrition in the infant.

*Techniques used to achieve cessation of breastfeeding.* Several studies give examples of how mothers stopped breastfeeding at different ages of the child.

- Applying something to the breasts to decrease breast milk production (in Myanmar: Williams et al, 2003; in Nigeria: Isiramen, 2002);
- Taking the child to a relative (in Nigeria: Isiramen, 2002);
- Giving other food or milk (in Nigeria: Isiramen, 2002; in Uganda: Bakaki, 2002; in Botswana: pMTCT Advisory Group, 2001);
- Decreasing the number of breastfeeds (in Nigeria: Isiramen, 2002; in Uganda: Bakaki, 2002).

*Reasons for early cessation of breastfeeding.* Some studies give reasons why mothers cease breastfeeding earlier than they planned or is recommended, and some also suggested ways of overcoming these problems. Both are included in the following list:

- Engorged breasts (in Botswana: pMTCT Advisory Group, 2002; in Myanmar: Williams et al, 2003);
- Breast inflammation (in Botswana: pMTCT Advisory Group, 2001; in Uganda: Bakaki 2002);
- Babies getting sick (weight loss, diarrhoea, vomiting, fever) (in Cote d'Ivoire: Leroy et al, 2002);
- Baby found to be HIV-positive (in South Africa: Seidel et al, 2000);
- Baby found to be HIV-negative (in Uganda: Bakaki, 2002);
- Crying babies (in Cote d'Ivoire: Leroy et al, 2002);
- Mother was not sleeping at night (in Cote d'Ivoire: Leroy et al, 2002);
- Intimidation from health workers (in Cote d'Ivoire: Leroy et al, 2002);
- Stigma (in Cote d'Ivoire: Leroy et al, 2002);
- Criticism from family (in Botswana: pMTCT Advisory Group, 2001).

The Botswana evaluation (pMTCT Advisory Group, 2001) found that these problems were more common when the mothers stopped breastfeeding early (0–6 months) rather than later. To address questions concerning cessation, it was suggested that mothers not admit the full truth and say that their baby was sick, the baby refuses milk, they have problems with the breasts, and/or that health worker advised stopping breastfeeding (in Uganda: Bakaki, 2002). Mothers in Nigeria suggested the need for psychological support during the transition process (Isiramen, 2002).

*Support for cessation of breastfeeding.* Several studies seem to suggest that support on early and/or abrupt cessation of

breastfeeding by health workers is poor. In Tanzania counsellors lacked knowledge of how to advise mothers to feed an infant after cessation and gave incorrect advice about early cessation of breastfeeding (de Paoli 2002). The Botswana evaluation (pMTCT Advisory Group, 2001) found that HIV-positive mothers who breastfed did not recall receiving advice about feeding their infant after 6 months of age.

## MIXED FEEDING

**Definition:** *feeding both breast milk and other foods or liquids.*

The current UN recommendation is that HIV-positive mothers should never use mixed feeding. They should either breastfeed exclusively or replacement feed exclusively, but not mix the two. The reason is that mixed feeding combines the risk of diarrhoea and other infections often associated with using infant formula or modified animal milk to replacement feeding with the risk of HIV-transmission due to breastfeeding. A study in Durban, South Africa (Coutsoudis et al, 2001) suggests that mixed feeding has a higher risk of HIV-transmission than breastfeeding.

Because of the recommendation against mixed feeding, pMTCT programmes ask antenatal HIV-positive women to choose between exclusive breastfeeding and replacement feeding, and to avoid mixed feeding. The reviewed studies show that most women make a distinct choice, but after delivery they often end up mixed feeding early in the baby's life, whether they initially chose to exclusively breastfeed or exclusively replacement feed.

Early mixed feeding was reported in a Botswana study (Shapiro et al, 2003). In India, most HIV-positive mothers initiated breastfeeding but introduced cow's milk

or other liquids early (South India AIDS Action Programme et al, 2001). In Myanmar, most HIV-positive mothers initiated breastfeeding but gave rice and broth early, making exclusive breastfeeding rare after a few months. Mothers often continue some breastfeeding, however, for a long time (Williams, 2001; Williams et al, 2003). A South Africa study of women of unknown HIV status who started out exclusively breastfeeding found most of the mothers introduced formula and/or solid foods early, half before 1 month and most by 3 (Chopra et al, 2000). A Tanzania study found that 85% of HIV-positive mothers started exclusive breastfeeding but 46% were mixed feeding within a few days of delivery (de Paoli et al, 2001). In a Uganda study, all HIV-positive mothers started out exclusively breastfeeding but switched to mixed feeding by 3 months (Bakaki, 2002). In Zambia, women of unknown HIV-status who started out exclusively breastfeeding usually switched to mixed feeding within a few days of delivery (Ndola District Management Team, 1999). Many of these studies found that abrupt cessation of breastfeeding was very difficult, and mixed feeding was often the result.

The experience of HIV-positive mothers who initiate replacement feeding but change to mixed feeding varies widely in the summarised studies that address the issue. The Botswana study by Shapiro et al (2003) found that most mothers who initiated replacement feeding changed to mixed feeding even though the programme used intense follow-up to prevent it. Another Botswana study said that nearly all the HIV-positive mothers who selected replacement feeding reported they were doing so successfully at interview (0–6 months) even though many reported running out of free formula at least once (pMTCT Advisory Group, 2001).

A Cote d'Ivoire study found that 69% of HIV-positive mothers who selected replacement feeding reported still doing so successfully at 3 months (Leroy et al, 2002). In Honduras, where no stigma seems to attach to formula feeding, providers said that HIV-positive clients were using formula without problems, and there were no reports or suspicions of surreptitious mixed feeding (Baek et al, 2002). On the other hand, a study in Zambia reported that HIV-positive women change to mixed feeding very early, whether they start out replacement feeding or exclusively breastfeeding (Omari et al, 2000).

## BREAST-MILK FEEDING

Under the current international HIV and infant-feeding guidelines, breast-milk feeding includes three potential modified infant-feeding options: wet-nursing, expressed and heat treated breast milk, and the use of breast-milk banks. The vast majority of programme experiences included here do not reflect informed choice counselling on all breast-milk feeding options. In India, for example, these options are not discussed at all (Sarna, 2002).

### Wet nursing

The compilation of programme experience included no concrete data on the use of wet nurses for the specific purpose of preventing HIV transmission. In Myanmar, wet nursing is common among household members, but mothers expressed concern in the case of an HIV infection. Thus, wet nursing is thought to be complicated by the need to test wet nurses and ensure that they remain uninfected (Williams, 2003). In Kenya, wet nursing was considered acceptable for older but not younger women, where study participants stated that this practice was common for orphans, but not

for babies of healthy mothers (Oguta et al, 2001). In the Indian pMTCT assessment, Sarna (2002) found that wet nursing was not discussed as an option with HIV-positive women.

## Expressed and heat-treated breast milk

*Heat-treated expressed breast milk not widely acceptable.* Several studies done mainly among mothers of unknown HIV-status indicate that expressing and heat-treating breast milk is not a widely acceptable option for HIV-positive mothers (in India: South India AIDS Action Programme et al, 2001; in Kenya: Oguta et al, 2001; in Tanzania: de Paoli et al, 2002; in Zimbabwe: Israel-Ballard et al, 2002). A third of the mothers in a South Africa study succeeded in expressing milk, but the idea of boiling breast milk was alien and dismissed (Chopra et al, 2000). Counsellors in Tanzania did not believe that heating breast milk would kill the HIV in it (de Paoli et al, 2002). In Zimbabwe, mothers felt that partners and family were neither supportive of nor knowledgeable about using heat-treated expressed breast milk; they could not succeed with this method unless they had their partner's support, but that more education about heat-treated expressed breast milk might generate such support (Israel-Ballard et al, 2002).

*Evidence exists that it can become acceptable and used.* In Myanmar, women participating in a trials study had a positive response to heat-treating expressed breast milk. The trials study showed that this option was feasible, with many homes having suitable pots for heating the milk. Mothers were purportedly amazed and delighted to learn that there is a free method to feed their infant if they had to be separated (Williams et al, 2003). Nevertheless, the study report notes that Myanmar health professionals lack confi-

dence in expression and heat-treatment of breast milk as an option, and may require further training and support. In a South Africa intervention project, the proportion of mothers who left expressed breast milk when they had to be separated from their infants rose significantly in the intervention area but not in the control area (Bentley et al, 2002).

A Zimbabwe study conducted individual and group in-depth interviews with 168 men and women specifically about expressing and heat-treating breast milk (Israel-Ballard et al, 2002). Although knowledge was low, 30% of the women had expressed and knew about manual expression. Expression was thought to be painful but only during a woman's first few expressions. Reasons given for expressing included baby not able to suckle due to sickness, feeding for orphans, sore nipples, and acquiring breast milk for various healing purposes. It is considered affordable and therefore sustainable, but only if the husband is supportive. Although expressing and heat-treating breast milk faces numerous barriers that prevent it from being widely acceptable, especially among rural, less-educated people, many participants believed these problems can be overcome with education.

*Pretoria pasteurisation.* Expressed breast milk of HIV-positive women must be heat-treated to be safe, which can be accomplished with the Pretoria pasteurisation method. The results of several studies in South Africa on this method have confirmed the efficacy and viability of inactivating the HIV virus in the breast milk of HIV-positive mothers through heating milk to 56-62.5 degrees C for 12-15 minutes (Jeffrey et al, 2002 a and b; Pullen et al, 2002). Another study in Puerto Rico found that lipolysis of breast milk (letting it stand hours at room temperature for 6) did not destroy HIV in most breast milk samples,

but confirmed that bringing breast milk to a boil did so (Chantry et al, 2000). One of the South Africa studies found that the 10 mothers using the Pretoria pasteurisation method who were interviewed were positive about the method and felt they could use it at home as well as in the hospital (Pullen et al, 2002).

## Breast-milk banks

No data or even anecdotal experience was found in the reviewed studies and programmes on the use of breast-milk banks for feeding children to prevent MTCT.

## AFASS

Methods of infant feeding by HIV-positive mothers are recommended by the UN only if they are acceptable, feasible, affordable, sustainable, and safe (AFASS) for the individual case being considered. The risks associated with each of these five attributes of infant feeding methods vary with the environment and the individual circumstances of the mother and her family. In areas where replacement feeding is considered AFASS by local decision-makers, there is little reported debate to the UN recommendations. Initially, in the industrialised world and some developing areas, pMTCT programmes opted to actively promote replacement feeding and provided little information or support to mothers about other infant feeding options. The experience of these programmes and others with respect to the five AFASS criteria is now becoming known and is reported, albeit unsystematically, in some of the studies reviewed here.

## Acceptable

**Definition:** *The mother perceives no barrier to replacement feeding. Barriers may be cultural or social or be due to fear of*

*stigma or discrimination. According to this concept the mother is under no social or cultural pressure not to use replacement feeding; she is supported by family and community in opting for replacement feeding, or she will be able to cope with pressure from family and friends to breastfeed, and she can deal with possible stigma attached to being seen with replacement food.*

In many countries where breastfeeding is the norm, replacement feeding is unacceptable, largely because women who do not breastfeed are suspected of being HIV-infected and are therefore subject to discrimination and shunning. Many documents reviewed here report fear of discrimination or actual discrimination against women who use formula and other methods of replacement feeding (in Botswana: Tlou et al, 2000, and Shapiro et al, 2003; in India: South India AIDS Action Programme et al, 2001; in South Africa: Rollins et al, 2002, and Seidel et al, 2000; in Tanzania: de Paoli et al, 2002, and Swartzendruber et al, 2002; in Zambia: Bond et al, 2002, Ndola District Health Management Team, 2002).

In some studies, stigma and discrimination were directed at an entire pMTCT programme because of its relation to HIV-AIDS (in Botswana: Shapiro et al, 2003; in Tanzania: Swartzendruber et al, 2002; in Zambia: Bond et al, 2002). However, a few studies report finding little or no evidence of stigma, and replacement feeding was acceptable (in Honduras: Baek et al, 2002; in South Africa: Chopra et al, 2000; in Thailand: Talawat et al, 2002).

Several studies report other problems besides stigma that made some infant feeding options unacceptable. India mothers thought formula was simply bad for the babies (South India AIDS Action Programme et al, 2001), and Swaziland mothers said that formula had 'brought

back malnutrition' (Vilakati and Shongwe, 2001). In Tanzania, counsellors did not believe that heating the expressed breast milk of HIV-positive mothers would destroy the HIV virus (de Paoli et al, 2002), and Zimbabwe mothers thought that expressed breast milk was unclean, associated with witchcraft, and perhaps dangerous (Israel-Ballard, 2001). In South Africa, however, heated expressed breast milk was considered acceptable (Pullen et al, 2002). A Uganda study concluded that exclusive breastfeeding might not be a viable option for HIV-positive mothers because abrupt cessation of breastfeeding was thought to be so bad for the baby (Bakaki, 2002).

In some studies, involvement of male partners and family members in decisions about infant feeding was a key factor in the acceptability of formula by HIV-positive mothers (in Botswana: Tlou et al, 2000; in Zambia: Hope Humana et al, 2002).

## Feasible

**Definition:** *The mother (or family) has adequate time, knowledge, skills, and other resources to prepare the replacement food and feed the infant up to 12 times in 24 hours. According to this concept the mother can understand and follow the instructions for preparing replacement feeds, and with support from the family can prepare enough replacement feeds correctly every day, and at night, despite disruptions to preparation of family food or other work.*

Many of the documents reviewed here report that formula is not a feasible infant feeding method for many mothers. Although the additional cost of formula (over breast milk) is often a key reason for resistance, other factors also contribute: inadequate knowledge about how to prepare, store, or give in a cup; or having no clean

water; and having no refrigerator (in Botswana: pMTCT Advisory Group, 2001; in South Africa: Chopra et al, 2000; McCoy et al, 2002; and Rollins et al, 2002; in Rwanda: Pham et al, 2002; in Uganda: Matovu et al, 2002). Some reports conclude that formula is feasible only for educated women living mostly in urban areas (in South Africa: McCoy et al, 2002; in Tanzania: de Paoli et al, 2002). Formula supplies are occasionally not available (in Botswana: pMTCT Advisory Group, 2001). Another reason that formula is not always feasible is because follow-up support by counsellors and other health care workers to enable mothers to deal with family and social resistance is not available (in Cote d'Ivoire: Leroy et al, 2002; in Rwanda: Pham et al, 2002; in South Africa: Seidel et al, 2000).

Preparation of modified animal milk was thought to be too complicated for some women in two studies (in Myanmar: Williams et al, 2003; in Zambia: Omari et al, 2000).

The feasibility of early abrupt cessation of breastfeeding is questioned by several studies, and as a result, the option of exclusive breastfeeding with early abrupt cessation for HIV-positive mothers is not considered feasible (in Botswana: pMTCT Advisory Group; in Tanzania: de Paoli et al, 2002; in Uganda: Bakaki, 2002; in Zambia: Ndola District Health Management Team, 1999; and in several countries: Rutenberg et al, 2002). One study did find that it was feasible to exclusively breastfeed with early abrupt cessation (in Nigeria, Isiramen, 2002).

Mixed views were reported on the feasibility of heated, expressed breast milk (in Myanmar: Williams et al, 2003; in South Africa: Pullen et al 2002; in Tanzania: de Paoli et al, 2002; in Zimbabwe: Israel-Ballard et al, 2001).



## Affordable

**Definition:** *The mother and family, with community or health system support if necessary, can pay for the cost of purchasing/producing, preparing, and using replacement feeding, including all ingredients, fuel, clean water, soap, and equipment, without compromising the health or nutrition of the family. This concept also includes access to medical care if necessary for diarrhoea and other illnesses and the cost of such care.*

A key criterion, affordability is at the crux of much of the debate on the use of replacement feeding, especially with infant formula. Many of the studies summarised here reported that low-income mothers could not afford to purchase infant formula, as evidenced by mother opinion, health worker opinion, and behaviour in pMTCT programmes where free infant formula was provided (in India: Sarna, 2002; South India AIDS Action Programme et al, 2001; in Kenya: Oguta et al, 2001; in Myanmar: Williams 2001; in South Africa: Bentley et al, 2002; Chopra et al, 2000; Rollins et al, 2002; Seidel et al, 2000; in Tanzania: de Paoli et al, 2000 and 2002; in Thailand: Talawat et al, 2002; in Zimbabwe: Chitsike, circa 2000). One programme that was short on funding provided free infant formula to a limited number of mothers, but when the programme had to stop giving free formula, the mothers could not afford to purchase it (in Rwanda: Pham et al, 2002). Some studies conclude that free formula gave the programme needed credibility as well as making replacement feeding affordable (in Honduras: Baek et al, 2002; in Zambia: Kankasa et al, 2002).

Some studies found that modified animal milk, although less expensive than commercial infant formula, was still too expensive for some but not all mothers (in Kenya: Oguta et al, 2001; in Myanmar: Williams,

2001; in Rwanda: Pham et al, 2002). Heated expressed breast milk is affordable according to two studies (in South Africa: Pullen et al, 2002; in Zimbabwe: Israel-Ballard et al, 2001).

A key issue is the fact that affordable replacement feeding methods for HIV-positive mothers implies that mothers know their HIV status, which is frequently not the case in many countries (Preble and Piwoz, 2002).

## Sustainable

**Definition:** *Availability of a continuous and uninterrupted supply and dependable system of distribution for all ingredients and products needed for safe replacement feeding, for as long as the infant needs it, up to one year of age or longer. According to this concept, there is little risk that formula will ever be unavailable or inaccessible, and another person is available to feed the child in the mother's absence, and can prepare and give replacement feeds.*

The main issue regarding the sustainability of replacement feeding with formula seems to be the cost of formula, especially for low-income women. Programmes that provide free formula solve this problem for women in the programme, but only for as long as the programme continues to provide free formula. Two studies report difficulties in sustaining replacement feeding when free formula was unavailable or stopped being available (in India: Sarna, 2002; in Rwanda: Pham, et al, 2002). UNICEF's decision to discontinue distribution of infant formula made national scale-up of a pMTCT programme difficult in Honduras (Baek et al, 2002).

Free infant formula does not guarantee an adequate supply, because some countries report that many mothers who are supplied with free infant formula still run out

(in Botswana: pMTCT Advisory Group 2001; in South Africa: Chopra et al, 2000). Some women in a free formula programme simply do not return for a follow-up supply (in Uganda: Matovu et al, 2002). Strategies used by mothers who run out of free formula include buying more milk, giving sugar water and/or fruit juice between feeds, give fewer feeds per day, and diluting the formula (in India: South India AIDS Action Programme et al, 2001; in South Africa: Chopra et al, 2000), and going to the clinic earlier than scheduled to get a new supply (in Botswana: pMTCT Advisory Group, 2001).

One study reported that mothers were concerned that wet nurses might be or might become HIV-positive and were concerned about the sustainability of wet nursing as an infant feeding option (Williams, 2001).

The sustainability of the option to exclusively breastfeed followed by early cessation and initiation of replacement feeding can be questioned because many women find it very difficult to sustain exclusive breastfeeding very long or to successfully achieve early cessation of breastfeeding. In some instances, the supply or perceived supply of breast milk may be lacking due to breast problems or the mother's perception that she does not have enough breast milk (in Uganda: Bakaki, 2002).

## Safe

**Definition:** *Replacement foods are correctly and hygienically prepared and stored, and fed in nutritionally adequate quantities, with clean hands and utensils, preferably by cup. This concept means that the mother or caregiver has access to a reliable supply of safe water (from a piped or protected well source); prepares replacement feeds that are nutritionally sound and free of pathogens; is able to wash hands and utensils thoroughly with soap*

*and regularly boil the utensils to sterilise them; can boil water for at least 10 minutes for preparing each of the baby's feeds; can store unprepared feeds in clean, covered containers and protect them from rodents, insects, and other animals.*

Safety in replacement feeding involves more than the provision of adequate quantities of breast milk substitutes that are contamination free. Caretakers must also have access to clean water, equipment, and environmental conditions and have the ability to wash hands and clean and sterilise feeding utensils on a continuing basis. In the case of modified animal milks, a supply of sugar and micronutrients is also required. Mothers must have the knowledge and skills to prepare replacement feeds, which may require proper initial instruction and demonstration and periodic follow-up by counsellors or other health care workers to ensure understanding. Finally, safe replacement feeding requires family and community support to overcome stigma and discrimination and provide access to health care if the infant becomes sick.

In general, the studies we reviewed suggest that it is difficult to meet all of the conditions necessary for safe replacement feeding. For example, in a South Africa study, only 28 women (15%) met the four locally defined conditions for safe replacement feeding (access to clean water, refrigerator, fuel for boiling water, regular source of income). A majority of women (15 of 28) planned to replacement feed even though they had less than ideal living conditions, and 10 of the 15 had only two or fewer conditions for safe replacement feeding (Rollins et al, 2002).

*Preparation and nutritional adequacy of replacement feeds.* Infant formula should be prepared according to the guidelines to have a nutritionally adequate feed. Sev-

eral studies, however, show this is not always the case. In a study in South Africa, although a standardised scoop was used in preparing formula, the number of scoops actually used varied considerably from one to seven (Chopra et al, 2000). In India, many thought that commercial infant formula was too expensive and gave diluted fresh cow's milk or diluted dried milk powder mixed with water instead. Sometimes milks were over- or under-diluted. Appropriate sugar and micronutrient supplements were not added (South India AIDS Action Programme et al, 2001). In Myanmar, recommending replacement feeding was considered problematic because there was considerable confusion between regular powdered milk and infant formula (Williams et al, 2003).

*General hygiene and water quality.* Water quality is discussed in several of the reviewed studies. In Myanmar, reluctance to boil water for infants is considerable (Williams et al, 2003). A Zambia study found that only about half of the interviewed households boiled water, a third added chlorine, and the rest took no precautions (Omari et al, 2002). However, a South Africa study found that most water was boiled, although usually for less than one minute, considerably less than required (Chopra et al, 2000). General hygiene varied. In Myanmar, domestic hygiene, including hand washing, is often poor (Williams, 2001). In South Africa, 17 household observations revealed that 'nearly all' homes had on-site soap, water, sanitary facilities, formula tins, and bottles that appeared clean (Chopra et al, 2000).

*Use of bottles.* Because cups are easier to clean than bottles and artificial nipples, cup feeding is recommended for infants. A Botswana study found that over 90% of mothers who used formula gave it to their 0-6-month olds using a bottle rather than a cup (pMTCT Advisory Group, 2001). About

half the Botswana mothers in the study sample cleaned the bottles by boiling. In India, participants in one study mentioned the need to clean bottles but not sterilise them (South India AIDS Action Programme et al, 2001).

## COUNSELLING AND INFORMED CHOICE

### Is counselling effective?

*Assessing the mother's personal circumstances and making informed infant feeding choices.* The objective of counselling on HIV and infant feeding is to assess the mother's personal circumstances in order to help her select the best feeding option for her and her baby, one that is acceptable, feasible, affordable, sustainable, and safe. Two of the reviewed studies specifically investigated whether counsellors adequately assessed the mother's situation as part of infant feeding counselling. In a Zambia study of 42 counsellors, very few (5-10) asked the mother if she had enough money to buy formula; could obtain adequate supplies of water and fuel; or had disclosed her HIV status to her partner, family, or friends (Kankasa et al, 2002). Although most of the counsellors in the Kankasa study 'somewhat' explored the feasibility and acceptability of several feeding options, exit interviews revealed that most of the mothers felt the counsellors had explained one option only. On the other hand, in a South Africa study, counsellors who had received specific training in locally defined conditions for safe replacement feeding consistently asked HIV-positive mothers about their infant-feeding intentions and then discussed the options available in light of the mother's personal situation (Rollins et al, 2002).

Additional studies found that counsellors simply did not help clients make an in-



formed choice on infant-feeding options or attempt to assess the feasibility of different options based on the client's circumstances (in Honduras: Baek et al, 2002; in Rwanda: Pham et al, 2002; in South Africa: Chopra et al, 2000; Seidel et al, 2000; in Tanzania: de Paoli et al, 2002; in Zambia: Kankasa et al 2002).

*Effective counselling strategies and techniques.* The comprehensive and successful South Africa counselling programme noted above used several counselling techniques that appeared to work: First, they recognised that explaining the advantages and disadvantages of many infant feeding options was too overwhelming for the client. Instead, they started with her feeding intention; assessed its appropriateness given her circumstances and experience; and, if the feeding intention was not realistic, the counsellor used a visual tool (decision tree) to help her determine a feasible option. Counselling took place over several sessions, not just one, so that the infant-feeding options could be explored in depth (Rollins et al, 2002). Another South Africa study found that HIV-positive mothers received information and advice from many different sources, not just counsellors, which needs to be accounted for in developing a counselling strategy (Bentley et al, 2002). In Rwanda, counsellors noted that mothers receive off-site counselling, and on-site counsellors need to know the quality and content of the off-site counselling (Pham et al, 2002).

### Do counsellors provide accurate and unbiased information?

Counsellors should be a source of accurate information about HIV and its transmission, prevention, and care. In this role, the counsellor's knowledge, attitudes, beliefs, and experience are important factors in the quality of counselling.

*Poor counsellor knowledge of pMTCT.* Several studies found inadequate knowledge of pMTCT among health providers, often directly compromising informed infant-feeding counselling. In some cases, the counsellors did not have correct information about the issues on which they were providing counselling. Some Honduran providers lacked knowledge about the probability of transmission through breastfeeding (Baek et al, 2002). A study in South Africa found through in-depth interviews that providers had limited knowledge of optimal infant feeding and MTCT risks, leading to a universal recommendation of formula feeding regardless of risk (Chopra et al, 2000). In Tanzania, some counsellors believed the risk of HIV transmission through breastfeeding was greater than risk of diarrhoea or malnutrition from not breastfeeding (de Paoli et al, 2002).

*Poor counsellor knowledge of infant-feeding norms and lack of guidelines.* Some studies pointed to lack of provider knowledge of national policies or guidelines. None of the 11 providers interviewed in a South Africa study had seen national or provincial guidelines on pMTCT (Chopra et al, 2000). In Rwanda, providers incorrectly believed that the pMTCT programme recommended replacement feeding over exclusive breastfeeding for babies of HIV-positive mothers (Pham et al 2002). Studies from Rwanda (Pham et al, 2002) and Tanzania (Swartzendruber et al, 2002) concluded that lack of guidelines and printed material had negatively affected counselling performance.

*Counsellor attitudes, beliefs, and experience can undermine counselling.* As a study in Botswana found, inadequate knowledge of HIV and pMTCT can erode counsellor confidence (pMTCT Advisory Group 2001). However, even if provider knowledge is up-to-date, it can run counter to provider attitude, belief, and personal experience, thus

causing problems for several reasons, including:

- *Lack of counsellor trust in exclusive breastfeeding.* A few studies mentioned lack of belief in exclusive breastfeeding. In Tanzania, most counsellors were unclear about the meaning of exclusive breastfeeding. None had breastfed exclusively themselves; others questioned its safety, did not believe it was possible, and/or said they would choose replacement feeding if they were HIV-infected themselves (de Paoli et al 2002). Chopra et al (2000) found a similar disbelief in South Africa, where four of eleven counsellors did not believe the results of a study (Coutsoudis et al, 2001) that showed that exclusive breastfeeding reduced the risk of MTCT.
- *Counsellor bias against exclusive breastfeeding or replacement feeding.* Numerous studies showed a counsellor bias, sometimes in favour of replacement feeding and sometimes in favour of exclusive breastfeeding for HIV-positive mothers. Counsellor bias in favour of replacement feeding and against exclusive breastfeeding is reported in many studies (in Honduras: Baek et al, 2002; in South Africa: Chopra et al, 2002; in Swaziland: Vilakati and Shongwe, 2001; in Tanzania: de Paoli et al, 2002; in Zambia: Kankasa et al, 2002). Other studies report a counsellor bias in favour of exclusive breastfeeding and against replacement feeding (in India: Sarna, 2002; in South Africa: McCoy et al, 2002). Bias against abrupt cessation of breastfeeding is also reported as an issue in some studies (in Nigeria: Isiramen, 2002; in Tanzania: de Paoli et al, 2002).
- *Lack of counsellor trust in expressing milk and/or heat treating breast milk.* Counsellors have not easily accepted

heat-treating breast milk as an infant-feeding option. Providers in South Africa (Chopra et al, 2000) and Tanzania (De Paoli et al, 2002) were not convinced of its feasibility or effectiveness and felt it would be very difficult to explain to mothers. In Zambia, Kankasa et al (2002) found that although providers demonstrated good knowledge of expressed heat-treated breast milk, they rarely ascertained the client's specific circumstances or recommended expressed heat-treated breast milk.

### **Follow-up support of infant feeding options**

Once a mother implements an infant feeding strategy, she often encounters difficulties that can lead to non-adherence if not addressed. The reviewed documents note several ways counselling can help support the chosen infant-feeding method:

*Help clients replacement feed correctly.* In countries where replacement feeding is not a traditional practice, counselling on the preparation, storage, and giving of formula is essential (pMTCT Advisory Group, 2001). Household observations in South Africa did find that caregivers knew not to save unfinished formula, despite cost, thus reducing the risk of contamination (Chopra et al, 2000). Monitoring the proper preparation of infant formula is already being done in Zambia (Kankasa et al, 2002).

*Monitor adherence to the infant-feeding choice to help address difficulties.* The monitoring of adherence applies equally to exclusive breastfeeding (in South Africa: Chopra et al, 2000; in Zambia: pMTCT Advisory Group 2001) and replacement feeding (in Botswana: Shapiro et al, 2003; in Cote d'Ivoire: Leroy et al, 2001).

*Partner and family involvement.* Since partners and family can greatly influence

the acceptability, affordability, feasibility, and sustainability of the mother's infant feeding choice, several studies recommend that they be included in counselling from the start (in Rwanda: Pham et al, 2002; in Tanzania: de Paoli et al, 2002; in Zambia: NDHMT, 1999; Bond and Ndubani, 1999).

*Help clients successfully implement proper cessation of exclusive breastfeeding.* As detailed above in the sub-section on cessation of exclusive breastfeeding, proper cessation of breastfeeding by HIV-positive mothers is very challenging and not widely achieved (for example, see Botswana: pMTCT Advisory Group, 2001; in Nigeria: Isiramen, 2002; in Zambia: NDHMT, 1999; Bond and Ndubani, 1999; in several Asian countries: Preble and Piwoz, 2002). A study in Zambia found that despite behaviour change communication and counselling interventions, HIV-positive mothers were still breastfeeding at 12 months rather than stopping at 6, as recommended (NDHMT, 1999; Bond and Ndubani, 1999). In Tanzania, counsellors gave incorrect advice about early cessation and lacked knowledge of how to advise mothers to feed an infant after cessation (de Paoli et al, 2002). The discussion above in the sub-section on cessation includes factors that support or hinder early or abrupt cessation, reasons given for early cessation, and techniques programmes use to address this challenge.

### **Training of health workers and counsellors**

Although it is generally believed that increasing the competency and motivation of counsellors and other health care workers in interpersonal communication, including counselling on all feeding options and lactation management, is a vital part of the infant-feeding component of pMTCT programmes, surprisingly little evidence was found about how this can best be achieved. There is little documented about

the amount of training needed, the minimum required content, methods and timing for training, mentoring and retraining, and by whom. A multi-country Horizons assessment notes that the training and follow-up training of counsellors seem to have a positive impact on pMTCT infant feeding programmes (Rutenberg et al, 2002). While some of the studies describe what they did to train counsellors, they offer little evidence on whether or not it was worth it and which aspects of the training approach worked well (Kankasa et al, 2002; Hope Humana et al, 2002; pMTCT Advisory Group, 2001; Rollins et al, 2002).

## **THE ROLE OF COMMUNITY, PARTNER, AND FAMILY SUPPORT**

### **Community stigma and discrimination**

Some of the summarised documents note that pregnant women of HIV-positive or unknown HIV status express *fear* of stigma and negative discrimination against HIV by partners and community (in Botswana: Tlou et al, 2000; in India: South India AIDS Action Programme et al, 2001; in Rwanda: Pham et al, 2002; in Tanzania: de Paoli et al, 2000; Swartzendruber et al, 2002; in Zambia: Bond et al, 2002 and NDHMT, 1999; Bond and Ndubani, 1999). Fewer studies report evidence of actual stigma or discrimination (in India: South India AIDS Action Programme et al, 2001; in Tanzania: de Paoli et al, 2000; in Zambia: Bond et al, 2002). One study reports that HIV-positive mothers said they did not suffer any discrimination at all as a result of not breastfeeding, although caretakers in the same community were of the opinion that the community did discriminate against mothers who didn't breastfeed (in South Africa: Chopra et al, 2000).

Many of the same documents and others report a simultaneous and woeful lack of knowledge about HIV and infant feeding in the community (in Botswana: pMTCT Advisory Group, 2001 and Tlou et al, 2000; in Tanzania: de Paoli et al, 2000 and Swartzendruber et al, 2002; in Zambia: Bond et al, 2002; NDHMT, 1999; Bond and Ndubani, 1999; Hope Humana, et al, 2002).

*Will an increase in community awareness decrease stigma?* Several studies that reported evidence of either the fear of stigma or stigma itself, as well as low public knowledge of HIV and infant feeding in the same community, suggest that increased community knowledge of HIV would decrease stigma and discrimination (in Botswana: Tlou et al, 2000; in Tanzania: Swartzendruber et al, 2002; in Zambia: NDHMT, 1999; Bond and Ndubani, 1999; Hope Humana, 2002). Only one study actually tested the idea; an area that implemented a public education and improved pMTCT services programme was reported to have reduced stigma (in Zambia: Hope Humana et al, 2002). In general, these documents note the need for behaviour change communication strategies, concerted public education campaigns, counselling job aids, and educational materials for low-literacy audiences that address the complex issues surrounding pMTCT and infant feeding.

However, some studies indicate that increased public knowledge about HIV is not always associated with reduced stigma and discrimination. A study in South Africa reported substantial stigma despite high public awareness about HIV (Chopra et al, 2000). A study in India found significantly more community knowledge about HIV in urban areas than in rural areas, even though a high degree of community and family stigma was present in both kinds of areas (South India AIDS Action Programme et al, 2001).

## Partner and family support

Several of the reviewed programmes report a low or problematic level of partner and family support for HIV-positive mothers (in Botswana: Tlou et al, 2000; in Cote d'Ivoire: LeRoy et al, 2002; in Zambia: Bond et al, 2002). In the reviewed programmes, this lack of family support is associated with negative discrimination by the family against HIV (in India: South India AIDS Action Programme et al, 2001; in Zambia: Bond et al, 2002), and/or with women who fear discrimination and so do not tell their partners or family they are HIV-positive (in Botswana: Tlou et al, 2000; in Rwanda: Pham et al, 2002; in Tanzania: de Paoli et al, 2000; in Zambia: Hope Humana, et al, 2002). In Cote d'Ivoire, lack of partner involvement or family support was associated with failed formula feeding by HIV-positive mothers (Leroy et al, 2002). Two studies report that wives are afraid to tell their partners they are HIV-positive, but not their mothers (in Botswana: Tlou et al, 2000; in Rwanda: Pham et al, 2002). In Tanzania, non-disclosure of HIV-status to husbands was a barrier to formula feeding, particularly given the high cost of formula (de Paoli et al, 2000).

In some places, reluctance to be tested for HIV and fear of discrimination seem to be related to lack of confidentiality, especially by health workers (in Botswana: Tlou et al, 2000; in India: South India AIDS Action Programme et al, 2001). Gender inequality remains the major underlying force driving many of these problems, according to some studies (in Zambia: NDHMT, 1999; Bond and Ndubani, 1999; Hope Humana et al, 2002; Rutenberg et al, 2002).

Many reports call for efforts of one kind or another to increase partner and family support for HIV-positive wives/mothers in

infant feeding. One Botswana study recommends that infant-feeding decisions be made in consultation with the father and maternal grandmother (Tlou et al, 2000). Another Botswana study proposes that families should be more involved and supportive of infant feeding (pMTCT Advisory Group, 2001). A Uganda study recommends that men be involved in the counselling process from the time of antenatal care (Bakaki, 2002). However, only one document evaluates an intervention that increased partner involvement: Zambia's Ndola project reports that an integrated approach involving partners from the beginning was successful in building support for the mothers (NDHMT, 1999; Bond and Ndubani, 1999).

## BEHAVIOUR CHANGE COMMUNICATION (BCC)

Several behaviour change communication issues were addressed in the studies reviewed, *outside* the context of counselling, including public education campaigns, educational materials (print and audio-visual), and counselling job aids for low literacy audiences.

*Components of effective public education programmes.* The reviewed studies offered little documented evidence or concrete suggestions about the components of effective public education programs. A Botswana study noted that community elders lacked knowledge about pMTCT that should be improved (Tlou et al, 2000). A review of a Tanzania pMTCT programme noted the need for more community input to the programme design (Swartzendruber et al, 2002). A Zambia document suggested having more community discourse as part of the community strategy (NDHMT, 1999; Bond and Ndubani, 1999).

*Need for behaviour change interventions.* As noted elsewhere in this synthesis, many studies highlighted the need for behaviour change interventions to address lack of knowledge or misunderstanding of HIV/AIDS transmission and prevention in general, as well as MTCT (in Asian countries: Preble and Piwoz, 2002; in South Africa: Chopra 2000; in Swaziland: Vilakati and Shongwe, 2001) and infant feeding in particular (in Uganda: Matovu et al 2002) among women clients, regardless of HIV or pregnancy status. Some studies noted that all pregnant women need infant-feeding information, education, and communication. For instance, focus groups with urban community representatives in a Zimbabwean study (Israel-Ballard et al 2001) found that participants felt strongly that information on all feeding options should be given to all mothers, not just HIV-positive mothers.

The behaviour change and communication needs were not limited to women clients. Studies also noted the need for behaviour change and communication interventions aimed at the partner, families, and community in general (in India: South India AIDS Action Programme et al, 2001) to decrease stigma and increase support for HIV-

positive clients (in Zambia: Bond et al, 2002).

Few studies reviewed included community-level information, education, and communication interventions. Those that did generally focused on other interventions with the same population (counselling), and they were not designed to specifically measure the effect of the behaviour change and communication interventions versus other interventions. For example, behaviour change and communication was reported to be a prominent component of the Ndola Demonstration Project, along with other interventions including the use of radio spots, print materials, and community 'ambassadors against AIDS'. Infant-feeding counselling is the stated centrepiece intervention of the project.

*Role of and need for information, education, communication, and other support materials for infant feeding.* A number of studies pointed to the need for and/or lack of infant feeding information, education, and communication materials to support infant-feeding health personnel, counselling protocols (in Rwanda: Pham et al 2002), and job aids. For the latter, Matovu et al (2002) developed an infant-feeding check-

list to help with the AFASS assessment of infant-feeding options in Uganda. Rollins et al (2002) conducted a study in South Africa where a visual tool was used to aid in selecting an infant-feeding option. A simple chart (decision tree) was used to focus the counselling discussion on home, personal circumstances, and family expectations. The study objective was to test a modified WHO/UNICEF HIV and Infant Feeding Counselling (HIFC) course approach to give more client-centred guidance on selecting an infant-feeding option, because it was known that presenting the six HIFC options to clients was overwhelming. The study reported that clients seemed satisfied with the counselling approach.

Several assessments of national pilot programmes mention, either under findings or recommendations, the need to develop or strengthen information, education, and communication strategies that address multiple issues related to HIV and infant feeding with clear and targeted messages. A focus on behaviour change and the importance of educational materials for mothers and counselling job aids for health workers is emphasised (in Rwanda: Pham et al, 2002; in Tanzania: Swartzendruber et al, 2002; in Zambia: Kankasa et al, 2002).

## CONCLUSIONS AND IMPRESSIONS

The programmes reviewed in this compilation show that since the development and dissemination of the 1998 guidelines on HIV and infant feeding, much valuable work in the area of HIV and infant feeding has been accomplished and documented in some way. Several countries now have policies, guidelines, and training programs in place, and in many pMTCT facilities HIV-infected mothers are receiving counselling, care, and follow-up support. However, many difficult problems remain to be solved. The findings reported here underscore the challenges that still exist in providing and applying clear global guidance on HIV and infant feeding. Perhaps the biggest challenge now is the scaling-up of successful pMTCT programs. It is our belief that the most appropriate response requires that in all maternal and child (MCH) facilities mothers are tested, receive balanced and quality counselling, appropriate pMTCT services, and follow-up support on HIV and infant feeding. In this conclusions section, we summarize some of the major findings from the material reviewed but also broaden our comments to include our own views and experiences that contribute to the interpretation of that material and the resulting conclusions in this section.

### Replacement feeding

The evidence clearly finds that women who know that they are HIV-positive are much more inclined to replacement-feed than women who do not know their HIV status. The choice and successful practice of replacement feeding, however, varies greatly between and even within countries. The studies reviewed do not help us to understand how long women are able to sustain

replacement feeding. We interpret the evidence presented here to indicate that the AFASS characteristics of replacement feeding (accessibility, feasibility, affordability, sustainability, and safety) have a major influence on the choice and successful practice of replacement feeding. The reviewed experiences indicate that replacement feeding is often not AFASS, especially for poor women. Many programmes reported that replacement feeding was not acceptable to mothers because they feared stigma and discrimination, which they felt was directed against mothers who did not breastfeed. Generally speaking, especially in Africa, breastfeeding was thought to be necessary for the baby's health, and not breastfeeding was highly associated with the mother being HIV-infected. Advice from counsellors and health workers to give replacement feeding was also identified as a major influence on mothers in many of the documents. Such advice, however, was not always based on an adequate assessment of the AFASS circumstances of mother and baby. Several studies reported counsellor bias, underscoring a need for strengthening the counsellor's knowledge about infant-feeding options, risk assessment, and counselling skills.

### Spillover of commercial infant formula

From the start of the first programmes addressing HIV and infant feeding, there were concerns that efforts to promote replacement feeding among women who are HIV-positive would 'spill over' to mothers who were HIV-negative or of unknown HIV status, causing a decline in breastfeeding rates. There was particular concern that the provision of free formula targeted to HIV-posi-

tive mothers would result in spillover. Although several programme documents expressed fear that spillover might occur, only two of the reviewed programmes specifically studied this issue: the Botswana study found evidence of spillover, while the Honduras study found none. The pMTCT site in Honduras attributed this to the careful standards established for counselling HIV-positive women, but these differences may also be attributable to the cultural acceptability and relative prevalence of non-breastfeeding in Honduras. The lack of attention given to the issue of spillover in most of the documents reviewed may indicate that spillover is not as big a problem as originally thought. In light of the continuing concerns, however, that have been raised by many infant-feeding specialists, we urge programmes to strengthen efforts to reduce the possibility of spillover and encourage future research to specifically measure and address this issue.

### Home-prepared formula

Although home-prepared formula based on modified animal milk is one of the two replacement feeding options suggested for HIV-positive mothers, not many select this option. Our own experience plus the little evidence presented in the studies reviewed here suggest that such non-selection appears to be true not only where free commercial formula is provided to HIV-positive mothers, but also in countries that do not provide free formula. UNICEF's decision not to scale-up their programme of financial support for the procurement of free formula following the assessment of a number of pilot pMTCT programmes and the decision by several governments not to initiate or continue subsidising infant



formula could generate more demand for home-prepared formula. In the pilot countries where UNICEF has phased out free formula, HIV-positive mothers may decide to switch to home-prepared formula given the perception that it is a less expensive alternative. It is our opinion, just as with commercial infant formula, that counselors should be trained to give better guidance concerning the adequate preparation and use of home-prepared formula as a replacement feeding option and ensure that it is AFASS before recommending it over exclusive breastfeeding.

## Exclusive breastfeeding

Reported rates and duration of exclusive breastfeeding are relatively low, regardless of the HIV status of mothers. Mixed feeding is far more prevalent. HIV-positive mothers who select to exclusively breastfeed apparently find it difficult to give only breast milk and frequently add other foods or liquid (resulting in 'mixed feeding'). This tendency to engage in mixed feeding underscores the importance of actively promoting exclusive breastfeeding among the general population and suggests the need to provide further support to HIV-positive women who choose exclusive breastfeeding. HIV-positive mothers should be counselled not only on the importance of exclusive breastfeeding but also on how to deal with pressure from relatives and others to only partially breastfeed. Studies from South Africa and Zimbabwe showed that exclusive breastfeeding rates can be increased in the HIV-positive population. We suggest that programs should not only aim at increasing exclusive breastfeeding rates among HIV-positive mothers who choose to breastfeed, but among all mothers. This could further reduce the pressure that HIV-positive mothers feel when deviating from what is considered to be 'culturally normal' feeding practices, while in-

creasing child survival in the general population.

## Cessation of breastfeeding

The documents reviewed make clear that early cessation of breastfeeding is a major challenge for HIV-positive mothers who choose breastfeeding as the option. There is inadequate study of how to transition from exclusive breastfeeding to exclusive replacement feeding while minimising the risks associated with mixed feeding. There is little or no information that demonstrates that early and abrupt cessation is feasible and/or safe. The reviewed studies that address this issue indicated abrupt cessation, within a few days, is not feasible for most mothers, can be unpleasant, and can even have dangerous health consequences for both mother and infant. There has been confusion about the meaning and feasibility of the prevailing guidance on early and abrupt cessation. Evidence indicates that the success of a mother's intent to stop exclusive breastfeeding early depends, in part, on access to replacement foods. Acceptability, however, may be even more important than access. Continued breastfeeding, into the second year of life or longer, is still the norm in many of the countries, so mothers may find it particularly difficult to deviate by stopping at 6 months or earlier, as is generally recommended. Some of the studies indicate, however, that women have found it easier and more culturally acceptable to stop breastfeeding at an early age (3 or 4 months) than to never initiate breastfeeding. All of these considerations should be discussed with the mother during counselling related to the AFASS of infant-feeding options.

Greater understanding is needed on how to accomplish early cessation in different cultures. The present guidelines lack clear

and practical guidance about the process, timing, and duration of cessation, as well as how and what to feed the child during the transition and thereafter. Programs need to provide better counselling on this topic and more intense, targeted, and timely support for the mother during and after the transition.

## Wet nursing, heat-treating breast milk, and milk banks

None of the reviewed studies reports a significant number of HIV-positive mothers choosing any of the so-called 'breast-milk feeding options': wet nursing, heat treatment of breast milk, or milk banks. Mothers are generally unfamiliar with wet nursing. The AFASS of expression and heat treatment of breast milk has not been widely tested. Milk banks do not exist in most countries. To date, counselling of HIV-positive mothers generally pays little attention to any of these options. It is not clear to us from the reviewed studies or elsewhere what conditions could facilitate the selection and success of these options. More formative research, and possibly operational research, in this area is needed to give better guidance on how practical these options are for HIV-positive mothers and what factors and support are needed for mothers to succeed with each.

## AFASS

Non-breastfeeding methods of infant feeding by HIV-positive mothers are currently recommended by the World Health Organization (WHO) if they are acceptable, feasible, affordable, sustainable, and safe (AFASS) for the particular mother-baby pair being considered. The documents reviewed provide a wealth of information on the reality faced by HIV-positive mothers with respect to the AFASS of infant-feeding options. Programme evidence and the ex-



periences of HIV-positive mothers has contributed to the development of more precise definitions of the five AFASS factors presented in the 2003 international guidelines on HIV and infant feeding (WHO et al, 2003), and it is thought that the current review will contribute to future guidelines. It is now essential that the training of health workers and counselling of HIV-positive mothers include an assessment of the reality of local and individual situations regarding these factors. We believe that the careful review with HIV-positive women of the AFASS of available options is the only way to provide adequate guidance concerning infant feeding, in combination with the provision of adequate follow-up and support.

## Counselling

The studies reviewed indicate that the quality of counselling given to HIV-positive mothers makes a difference. Counsellors influence mothers' decisions and practices related to infant feeding, as well as their success in following international and national recommendations or guidance. In many cases, however, counsellors do not adequately address the AFASS conditions of feeding options and, in addition, often manifest a clear bias towards one feeding option or another. The reviewed documents also seem to indicate that where counsellors did receive adequate training and support, the quality of the counselling improved. According to a study in South Africa, the success of counselling improved when the counselling process was better structured and when the infant-feeding options that are most AFASS in a given community were identified and discussed first, rather than a complete review of all options currently recommended by WHO.

From the programmes reviewed in this compilation, it is clear that counselling on HIV and infant feeding should not be a one-

time event, nor should it only occur during post-test counselling when a woman may be less receptive and unable to focus adequate attention on this issue. Counselling and support that address cultural realities and the experiences of individual mothers, both successes and failures, should be provided during multiple sessions.

To improve the counselling and support to HIV-positive mothers, clear national and local guidelines on counselling must be developed, including recommendations on when and how to counsel mothers and what follow-up support is required. These guidelines should also clearly stipulate which infant-feeding options are locally AFASS and therefore which should be included (or at least prioritised) in counselling HIV-positive women. They should be accompanied by a realistic human resource capacity development plan outlining who should be responsible for the counselling, training, and support that should be provided, as well as plans for monitoring and evaluating the impact of the counselling. Adequate counselling and client materials should be made available to guide the counselling process and assist individual HIV-positive women in selecting, understanding, and successfully carrying out the best option. Counselling should also include information on the safe and timely transition to other AFASS options, should the need arise, as well as the appropriate and timely introduction of complementary foods by six months of age.

## Community attitudes and stigma

The people closest to an HIV-positive mother—her partner and family—are crucial to the acceptability of whatever feeding option she chooses. However, only one of the programmes reviewed here (Hope Humana et al, 2002) specifically targeted relatives and families or actively included them in the counselling on infant feeding.

The reviewed documents do not clearly show whether there is real discrimination against HIV-positive women who deviate from common infant-feeding practices or only the fear of HIV-positive women that they will be 'discovered' because of their infant-feeding choice and subsequently discriminated against. No documentation of actual stigma and discrimination (shunning, rejection, or violence) were reported to be directly associated with infant feeding, although discrimination against women because they were HIV-positive has been documented. This does not necessarily mean that discrimination due to infant-feeding practice is not happening, but it does raise the issue of whether the generally perceived prevalence of stigma and its repercussions is due to actual discrimination or fear of it. The issue of fear, in and of itself, raises the question of how prevalent, serious, and widespread the repercussions might actually be.

To address these issues, we propose three strategies. First, educate the population at large about infant feeding, including the importance of exclusively breastfeeding and the relative risk of HIV transmission by HIV-positive mothers during pregnancy, birth, and breastfeeding. The promotion of exclusive breastfeeding among the general population must be included in this strategy. If exclusive breastfeeding were to become more widely accepted and possibly even the 'social norm', then those HIV-positive women who have no realistic choice other than to breastfeed will have less difficulty dealing with pressures to introduce other foods and liquids at an early age. The second strategy is to provide counselling to relatives and key family members of HIV-positive mothers in order to create a more positive and supportive environment for any of the infant-feeding choices that HIV-positive women make. The last strategy is to adequately address the issues of AFASS, stigma, and discrimination as part of the

counselling of HIV-positive women, providing guidance on how to deal with possible repercussions of stigma and discrimination.

## Documenting experiences

While this review provides valuable insights into programmes on HIV and infant feeding, many questions remain about the AFASS of different feeding options and how best to counsel and support HIV-positive women and their children with the limited human resources presently available.

Furthermore, our worldwide search for documents indicates that systematic evaluations of HIV and infant-feeding programmes are rare. Efforts should be made to (1) encourage evaluations, in addition to more effective documentation and dissemination of experiences by individual programmes and (2) support continued efforts to identify and creatively share this information.

In order to facilitate additional analysis and review of the documents in this compilation, and to support future research by in-

terested readers, most original source documents are available at [www.qaproject.org](http://www.qaproject.org). Contact information for editors, researchers, authors, and organisations responsible for preparing the source material is appended to encourage future communication; continuing dialogue; and the sharing of materials, ideas, and lessons learned between projects, countries, and regions of the world.

# SUMMARIES BY STUDY, WITHIN COUNTRIES

## BOTSWANA

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### Evaluation of Infant Feeding Practices in pMTCT (pMTCT Advisory Group, 2001)

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#### Document title

Evaluation of Infant Feeding Practices by Mothers at pMTCT and non-pMTCT Sites in Botswana

#### Authors

pMTCT Advisory Group

#### Institution

pMTCT Reference Group, Botswana Food and Nutrition Unit, Family Health Division, Ministry of Health Botswana

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### Background

The Government of Botswana (GOB) started a programme to prevent mother-to-child transmission (pMTCT) in April 1999, initially in two districts (including all primary care health care clinics and the district referral hospital). In July 2000, six additional districts were added. The Harvard Aids Institute and GOB are testing the efficacy of ZDV (zidovudine) in combination with NVP (nevirapine). CDC and GOB are developing the voluntary counselling and testing (VCT) component of the programme. The programme included counselling on infant feeding options, and developed *Infant Feeding Guidelines for the Health Worker* (revised July 2000) and two information booklets: *Infant Formula Feeding Guide for the Mother* and *Questions and Answers*

*on Infant Formula Feeding for Mothers*. The programme was formally evaluated in 1999 and again in 2001 (Willumsen and Rollins, 2001).

The Botswana pMTCT programme has the following components:

- Mothers receiving antenatal and postnatal care in the programme have their HIV status measured.
- Free ZDV is given to all HIV-positive mothers from 34 weeks pregnant to delivery and to their newborns from birth to 4 weeks of age.
- *Recommendations to HIV-positive (HIV+) mothers*: Replacement feed with formula (by cup) and avoid breastfeeding. HIV+ mothers who do not want to formula feed are advised to breastfeed exclusively for 3–4 months followed by abrupt cessation of breastfeeding.
- *Recommendations to HIV-negative (HIV-) and unknown HIV status*: Exclusive breastfeeding for 4–6 months.
- HIV-positive mothers are given free formula for 6 months (recently extended to 12 months), but no feeding equipment.

### Methodology

The study was directed by the pMTCT Advisory Group, a committee of persons from key Botswana agencies, with technical assistance from two international consultants. Data on feeding practice were obtained from mothers and other caretakers of in-

fants using semi-structured interviews in four programme and four non-programme districts. In each study district, four facilities (clinics and hospital) were purposefully selected to provide an adequate number of infants and a range of environs (urban, large village, rural). Interviews were also held with health staff in these facilities. A sub-sample of mothers still in the postnatal ward (HIV-positive and -negative) of programme hospitals was interviewed. Data were collected by nursing students after three days of training. The data collection instruments and procedures were reviewed by the committee and consultants, pilot tested using the nursing students after their training, and modified appropriately. Field work was done June 25–August 15, 2001.

A total of 776 caretakers were interviewed: 283 in non-programme sites and 493 in programme sites (226 HIV-positive and 267 HIV-negative). Caregivers were asked about feeding practice in the previous 24 hours, during the first week of life (focussing particularly on the first feeds) and between 1 and 6 weeks (first immunisation visit) of life. In addition, interviews were held with 59 mothers in postnatal wards at programme hospitals, 48 health staff at non-programme sites, and 90 health staff at programme sites.

Data were analysed by the HIV status of the mothers, the age of the child, and rural/urban. All mothers in the programme group were identified as either HIV-positive or HIV-negative. The HIV-status of all mothers in the non-programme group was "unknown", meaning unknown to the study. The mothers in the non-programme

group may or may not have known or thought they knew their HIV status, but the study had no information about this. HIV-positive mothers in the programme group were further divided into mothers who chose to formula feed and those who chose to exclusively breastfeed. The analysis assumed that the ratio of HIV-positive mothers to HIV-negative mothers was the same in the programme and non-programme groups.

## Results

This study produced a mountain of data; its report presents the results in 33 tables and three graphs. There are many insights in these results; we summarise the important ones here.

The programme appears to increase formula feeding among HIV-positive mothers: Most HIV-positive mothers in the programme decided to formula feed (Row 1, Table 1), and nearly all the children (90% in urban areas and 87% in rural areas) were exclusively formula feeding at the time of the interview if they were 0-6 months of age (Row 5, Table 1), or were given formula as the main milk at interview if they were 7-12 months of age (Row 10, Table 1). The data indicate that this was a result of the programme because the rates of formula feeding in the pooled (HIV-positive and HIV-negative) programme group were much higher than in the non-programme group.

Most HIV-negative women in the programme decided to breastfeed: 92% decided to breastfeed (Row 3, Table 1).

Spillover of formula feeding among HIV-negative mothers: For children aged 0-6 months, only 20% of the HIV-negative breastfeeding mothers in the programme were doing so exclusively at the time of the interview. Similarly, only 30% of the

few breastfeeding HIV-positive mothers were doing so exclusively at the time of the interview, resulting in a pooled EBF rate of 21% for all programme mothers compared with 37% in the non-programme group. Generally mothers introduced formula at a very early age rather than other milks (Row 6, Table 1). Thus, the programme's successful efforts to increase formula feeding among HIV-positive mothers apparently had a spillover effect on the HIV-negative mothers (and possibly on HIV-positive mothers who decided to breastfeed), causing them to fail to breastfeed exclusively. This was true for both urban and rural mothers, although no HIV-positive urban mothers decided to breastfeed.

The programme appears to reduce the number of children aged 7-12 months fed only home-made porridge: 52% of non-programme mothers fed their 7-12 month olds only home-made porridge (nothing else) the day before the interview, compared to 27% in the programme group (Row 13, Table 1). The mothers in the programme group used more commercial infant food.

Most mothers use a bottle to feed formula: Over 90% of mothers who used formula gave it to their 0-6 month olds using a bottle. This is true in both programme and non-programme groups (row 7, Table 1).

More rural than urban "formula" mothers cleaned the bottle by boiling: About half of all mothers who formula fed cleaned the bottle by boiling (row 8, Table 1). In the non-programme group, 58% of rural mothers and 42% of urban mothers said they regularly use this method, and in the programme group the figure is 68% in rural mothers and 49% in urban mothers.

Formula not always available: When HIV-positive mothers who were formula feed-

ing were asked if they had ever run out of formula, 32% (47 of 153) with children 0-6 months old said yes, and 47% (27 of 63) with children 7-12 months old said yes.

Cessation of breastfeeding not a success story: Most HIV-positive mothers who breastfed did not recall receiving advice about feeding after 6 months (23/35 = 66%). Most who had stopped by the time of the interview had done so by gradually changing to other milks (7/13 = 54%). Compared to mothers of older children (7-12 months), mothers of younger children (0-6 months) who stopped breastfeeding were more likely to have suffered engorgement (4/8=50% versus 1/5=20%), breast inflammation (3/8=38% versus none), and criticism from own mother for stopping (1/8=13% versus 1/5=20%).

Poor staff knowledge and counselling: The report says there was poor knowledge of HIV and MTCT among trained and untrained staff at both programme and non-programme sites. Many did not feel confident in counselling on infant feeding practices.

## Conclusions and recommendations of authors

The report includes numerous recommendations of relevance to pMTCT-related training, programme support, monitoring, policy, and community awareness:

Training: 1) Training should include the role of pMTCT programme beyond the mother's choice of infant feeding method, to support her infant feeding practices and monitor these in order to manage difficulties. 2) Training on (and demonstration of) preparation, storage and giving of formula feeds and continuing support for mother should be strengthened. 3) Support structures need to be devised with extra care paid to intervention messages to protect

HIV-negative mothers and mothers of unknown status from "spillover" of formula feeding. 4) Staff skills to promote and support exclusive breastfeeding (including avoidance of pre-lacteal feeds), for HIV-positive women who choose to breastfeed and for HIV-negative mothers and mothers of unknown status should be developed. 5) Training programme for infant feeding practices should be revised and developed, and include training for all health workers on optimal complementary feeding. 6) Appropriate strategies and training for health workers to support HIV-positive mothers in the early cessation of breastfeeding should be devised and developed. 7) Nutrition training should be integrated with other programmes (IMCI, BFHI), in the context of HIV, to optimise child survival (avoid MTCT, malnutrition and diarrhoeal illness and optimise development). 8) Staff knowledge of HIV, MTCT and counselling skills in order to effectively support mothers need to be improved.

**General programme support:** 1) Support of all infant feeding practices, antenatally and in the early postnatal period (BFHI) should be strengthened. 2) Formula feeding practices should be optimised. 3) All infant feeding practices, not just mothers' initial choice should be monitored. 4) Efforts need to be made to increase EBF rates among mothers of unknown status and HIV-negative mothers. 5) Mothers access to skilled counsellors, for follow-up support in addition to initial counselling sessions needs to be improved. 6) The use of cup rather than bottle for feeding formula milk to infants should be promoted. 7) Consider providing mothers with larger tins of formula, possibly branded, although the latter must be given careful consideration given the already considerable "spillover" of formula feeding to uninfected mothers. 8) Means to identify mothers on pMTCT programme, so that they may access help at alternative clinics if they move area, need to be developed. 9) Supervision and support structures

**Table 1. A Few Key Results**

HIV Status	Non Programme	Programme		
	Unknown	HIV –	HIV +	Pooled
<b>Children 0-6 months</b>				
1. Sample size	186	157	158	315
2. Decided to formula feed	16 (9%)	12 (8%)	141 (89%)	153 (49%)
3. Decided to breast feed	169 (91%)	144 (92%)	15 (9%)	159 (50%)
4. Received BF within 1 hour	63 (34%)	49 (31%)	25 (16%)	74 (23%)
5. EFF of those choosing FF <sup>2</sup>	14 (88%)	9 (6%)	139 (99%)	148 (97%)
6. EBF of those choosing BF <sup>2</sup>	60 (37%) <sup>3</sup>	27 (20%) <sup>3</sup>	3 (30%) <sup>3</sup>	30 (21%) <sup>3</sup>
7. Use bottle to give formula <sup>2</sup>	56 (93%) <sup>3</sup>	45 (88%) <sup>3</sup>	129 (91%) <sup>3</sup>	174 (91%) <sup>3</sup>
8. Clean bottle by boiling	29 (48%) <sup>3</sup>	34 (67%) <sup>3</sup>	78 (55%) <sup>3</sup>	112(58%) <sup>3</sup>
<b>Children 7-12 months</b>				
9. Sample size	97	90	68	158
10. Main milk formula <sup>1</sup>	9 (9%)	10 (11%)	29 (43%)	39 (25%)
11. Main milk breast <sup>1</sup>	65 (67%)	69 (77%)	7 (10%)	78 (49%)
12. Use bottle to give formula <sup>1</sup>	56 (93%) <sup>3</sup>	45 (88%) <sup>3</sup>	129 (91%) <sup>3</sup>	174 (91%) <sup>3</sup>
13. Home-made porridge only <sup>1</sup>	47 (52%) <sup>3</sup>	21 (25%) <sup>3</sup>	19 (66%) <sup>3</sup>	40 (27%) <sup>3</sup>

Notes: 1. Feeding practice yesterday. 2. Feeding practice continuously between birth and interview date in 0-6 month olds. 3. Denominator less than sample due to missing data.

for health workers from district management team should be instituted.

**Monitoring:** 1) The tracking of "spillover" by monitoring infant feeding practices on a regular basis should be considered. 2) The morbidity costs of formula feeding practices need to be investigated. 3) A community-based study of the mothers who do not enroll or attend the pMTCT programme should be conducted to establish their reasons for this. 4) Clinic-based surveys such as this should be repeated every 1-2 years to monitor changes in infant feeding practices after measures to improve the programme have been implemented. 5) Data collection methods at clinics need to be standardised to facilitate auditing of programme.

**Policy:** 1) A review infant feeding policy and approach to breastfeeding should be conducted. 2) Policy on abrupt cessation of breastfeeding by HIV-positive mothers

needs to be reviewed and disseminated. 3) Cessation of breastfeeding should not be recommended for an infant already infected with HIV. The (decreasing) risks of continued exposure and transmission through breastfeeding need to be weighed against the risks of diarrhoea and malnutrition due to cessation of breastfeeding, if safe replacement milks are not available, affordable and acceptable. 4) HIV-positive women who have chosen to breastfeed should be encouraged and supported to do so exclusively for the first 6 months of life. Mothers whose infant is thought to be uninfected at the time she would like to introduce other fluids or foods should be advised on the best way to make a safe transition from breast milk to replacement milk feeding (formula or modified animal milks).

**Community awareness/communication:** 1) Community awareness of programme and components needs to be increased. 2)



Assistance should be offered to mothers with disclosure of status and involvement of family members in infant feeding support.

### Methodological considerations/ reviewer's comment

**Strengths:** This large and well-done study has several important advantages: comparison group (programme versus non-programme); large sample size; knowledgeable, external evaluation team; pre-tested data collection instruments; trained data collectors; many different variables measured and reported; and explicit discussion in the report of methodological limitations.

**Limitations:** There are also some important limitations to the study and report, including: mother recall data only, which is subject to recall bias (no direct observation); assumption of equal prevalence of HIV-positive and HIV-negative in programme and non-programme groups; statistical significance of differences between groups not reported; and sample of mothers from programme sites selected by health workers with a bias towards mothers who enrolled in programme and who were actively participating.

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## Community Responses to pMTCT in Botswana (Thou et al, 2000)

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### Document title

Working report on community responses to initiatives to prevent mother-to-child transmission of HIV in Botswana

### Authors

Tlou S, Nyblade L, Kidd R, Field ML

### Institution

University of Botswana; International Center for Research on Women, Washington; PEER Consultants, Botswana; Society for Women and AIDS, Botswana; Youth Matters, Botswana

**Date** June 2000

**Country** Botswana

**Document type** Report

**Source** ESARO CD

### Background

In response to the high seroprevalence of HIV infection (43% in urban and 30% in rural antenatal clinics in 1998), the Government of Botswana in collaboration with the Harvard AIDS Institute and UNAIDS initiated a MTCT programme to provide mothers with: a short-course AZT (from 34 weeks and during labour, plus for 4 weeks to infant), information on alternatives to breastfeeding, and free formula for those choosing not to breastfeed. Due to time constraints, however, there was little consultation or feedback with targeted communities, so this formative research was conducted to obtain information that could be used to improve the effectiveness and acceptability of messages and services.

### Methodology

Focus group discussions (FGD) were held with mothers (of unknown HIV status) and diverse residents, and in-depth interviews were conducted with participants (at vari-

ous levels) in the pMTCT programme in one of the targeted communities near Gaborone from November 1999 to May 2000. Due to difficulties in locating women willing to be interviewed, the recruitment area for in-depth interviews was expanded to include the central maternity hospital in Gaborone (Princess Marina). Unfortunately, this report neither identifies which comments were provided by programme participants nor specifies the number of FGD participants from each of the community groupings. In addition, details are not provided on the three health provider interviews that were planned/conducted.

### Results

A large amount of information on community and mothers' beliefs and knowledge of HIV and MTCT was reported. For the purpose of this summary, the focus is limited to information relating to infant feeding and MTCT.

Confusion as to modes of transmission was evident from many FGD participants, and there was an assumption that all infants would be infected by their mother, especially during pregnancy and delivery, due to shared blood supply, which also cast doubt on the effectiveness of AZT.

Awareness of MTCT programme was limited among fathers and community elders, although there was some awareness of a drug to prevent MTCT, but not that it was available in Botswana. Most mothers had limited knowledge of specific components of MTCT programmes, other than availability of the drug. Infant feeding counselling was less frequently mentioned (report gives no figures).

Fear of disclosure of positive test results was great, with mothers being the only person consistently cited as being the one people would disclose to and frequent

mention of partner disapproval, denial, blame, discrimination and violence in response to a positive result. Many were concerned about lack of confidentiality, from service providers, friends and family members.

Influence of male partners in decision making was evidenced by mothers' concerns regarding VCT, programme participation and taking AZT tablets without partner approval.

Breastfeeding was regarded as norm and tradition, and part of being "a real woman". There was recognition of the benefits of breastfeeding in terms of protection from disease and the dangers and difficulties of bottle-feeding, in addition to the financial burden. In particular, more male participants commented that bottle-fed children are more prone to illness.

Non-breastfeeding mothers were regarded as uncaring and more concerned with their appearance and sexuality. Tradition maintains that a breastfeeding mother should not have sex with a man who is not the baby's father while lactating, as this would harm the child: breastfeeding assures her partner of her faithfulness.

Some legitimate reasons for not breastfeeding was stated (such as cancer, breast problems, returning to work, pregnancy and HIV), but these would need to be explained to a wide range of people. Not breastfeeding is becoming associated with HIV infection.

Infant feeding decisions need to be taken in consultation, especially with the child's father and the maternal grandmother (who cares for the mother during the traditional post-delivery confinement and ensures she adheres to cultural rules). However, a few women asserted that they would make feeding decisions alone, as the child "was theirs".

The underlying concern was the infant's health, and this overrode any traditional norms.

## Conclusions and recommendations of authors

Knowledge of pMTCT programme: Knowledge was limited among community members and males, and therefore education directed toward community members and males on various components needs to be improved, as others greatly influence a mother's participation in the programme. Community members should be involved in designing the communication strategy.

HIV/AIDS stigma and discrimination: There is great stigma and discrimination associated with testing and positive HIV status. Participatory education strategies are needed to dispel incorrect beliefs.

HIV and breastfeeding: Breastfeeding is a cultural norm. Acceptance of free infant formula from the clinic is seen as a clear indication of a woman's HIV-positive status, which leads to discrimination. Husbands and partners have great influence on a woman's decision to test for HIV and have some influence on treatment and infant feeding decisions.

## Methodological considerations/ reviewer's comment

Weakness: The report does not clearly identify which comments were attributable to which group and no information is given of the health worker interviews.

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## Adherence to Recommended IF Strategies in Botswana (Shapiro et al, 2003)

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### Document

Concerns regarding adherence to recommended infant feeding strategies among HIV-infected women: results from the pilot phase of a randomized trial to prevent mother-to-child transmission in Botswana

### Authors

Shapiro R, Lockman S, Thior I, Stocking L, Kebaabetswe P, Wester C, Peter T, Marlink R, Essex M, Heymann S

### Institution

The Botswana-Harvard AIDS Institute Partnership, The Harvard School of Public Health, Department of Immunology and Infectious Diseases, and Department of Health and Social Behavior

### Date 2003

### Country Botswana

### Document type

In press (AIDS Education and Prevention)

## Background

Botswana MoH recommends formula feeding (FF) for HIV-positive mothers and provides it for free in government clinics. FF is exclusivity recommended for mothers choosing breastfeeding. Both FF and exclusive breastfeeding (EBF) are traditionally uncommon in Botswana.

The purpose of this research was to study the adherence to these 2 feeding practices in rural Botswana.

## Methodology

This was part of the pilot phase of a randomised control trial of EBF plus the administration of AZT while breastfeeding versus FF. All women received AZT from 34

weeks gestation and infants for 1 month. Between April 2000 and March 2001, 75 women were randomised to EBF plus daily AZT to uninfected babies for 6 months, or to FF (AZT to babies for 1 month). Formula was provided for free. All women had access to safe water from standpipes in the village. Recruitment was at 34 weeks gestation, post-partum follow up monthly to 9 months with counselling to encourage exclusivity at each visit. Those breastfeeding were encouraged to begin weaning from 5 months. Detailed feeding history was obtained at each visit. Maternal breast examination was performed at each visit to evaluate breast health and evidence of breast milk production (= at least one drop of milk expressed after 3 squeezes, modified halfway through the study to "flow of more than a drop of expressible milk") at visits later than 1 month. Informed consent from all mothers and IRB approvals (Botswana and Harvard) were obtained.

**Reviewer's Comment:** The determination that a mother is breastfeeding on this basis (at least a drop of milk expressed by 3 squeezes) is not an established methodology. There was some discussion of this in the e-mail forum hosted by UNAIDS (13 Aug – 13 Sept 2002) with questions raised about the specificity of the method. The authors acknowledge the need for validation of the technique. No alternative methods have been established.

## Results

Less than 20% of all pregnant women offered HIV testing during the period of this pilot study agreed to testing and then to participation in the study. After loss to follow-up (6) and deaths (4), 31 mothers who were practicing EBF and 34 who were practicing FF had at least 3 follow up visits (7.2 visits per infant [90% of those scheduled]

from one to 9 months of age). Some loss to follow up may have been due to mothers' dissatisfaction with their assigned feeding mode. Age, parity, marital status (most were unmarried), viral load and CD4 counts were similar in both groups.

Three out of 31 EBF women did so exclusively for 3 months, none for 5 months. Giving of water was reported at 72% of visits in the first 5 months, cereal or porridge at 27%, juice at 20%, fruits or vegetables at 18%.

Two FF women were encouraged to breastfeed after their babies were found to be HIV-infected at age one month. Between 5 and 7 out of the remaining 32 (16–22%) FF women reported or were witnessed to be breastfeeding at some time during the first 9 months (often for the first time after several months of follow up). From 2–9 months 16/32 (50%) of FF women had evidence of breast milk production on at least 2 visits. The FF women who had or gave evidence of breastfeeding were not different from those who did not in terms of most variables, although higher viral loads were significantly associated with having breast milk on fewer than 2 examinations (compared to at least 2).

Seventeen women refused to be randomised because they wanted to FF; they were older, more likely to be married and had had more children than those who agreed to randomisation. Three in 17 (18%) reported breastfeeding at some time, and 9/17 (53%) had evidence of breast milk production (similar to the group randomised to FF).

**Authors' discussion:** Adherence to EBF or exclusive FF was poor in spite of the intensity of follow up involved in a clinical trial, and the recorded adherence may itself have

been an overestimate. However, increasing acceptance of the pMTCT programme and a reduction in the stigma associated with FF may be leading to greater adherence over time. Low adherence to exclusivity has been reported from many different settings. The fact that several FF women reported breastfeeding for the first time after 6 months may reflect an increasing willingness to "admit" to it, and perhaps that women do not want to and do not know how to wean early. Evidence of expressible milk after 2 months may be an indicator of breastfeeding in the early postpartum period.

## Conclusions and recommendations of authors

The authors present the following conclusions: 1) the use of breast examination as a determination of breastfeeding needs validation; 2) consideration (expectation) needs to be given to poor adherence when recommending feeding strategies different from local customs; and 3) strategies that allow women to feed their babies as they please (e.g., prophylactic ARVs for breastfeeding babies or therapeutic ARVs for mothers) need to be evaluated.

## Methodological considerations/ reviewer's comment

**Limitations:** There was no assessment of counselling quality, and breast examination technique may have varied between observers. EBF women may have thought that the AZT they and their babies took would make breastfeeding safe. Small sample size.

This was a small (albeit carefully conducted) study that raises serious concerns about expecting (rural) women to conform to advice on how to feed their babies.

Uptake of IF Intervention in Côte d'Ivoire (Leroy et al, 2002)

**Document title**  
Uptake of infant feeding interventions to reduce postnatal transmission of HIV-1 in Abidjan, Côte d'Ivoire  
*(This summary is also derived from "Exclusive breastfeeding and early cessation of breastfeeding to prevent HIV-1 transmission through breast milk", presented at the Ghent Workshop on Prevention of HIV Transmission through Breast-milk, December 12-13 2002, which was based on the same material.)*

**Authors**  
Leroy V, Becquet L, Ekouevi D, Viho I, Castetbon K, Sakarovitch C, Elenga N, Dabis F, Timité-Konan M

**Institution**  
The DITRAME PLUS ANRS 1202 Project

**Date** 2002

**Country** Cote d'Ivoire

**Document type**  
Poster MoPeD3677 at Barcelona Conference

**Source**  
Barcelona Abstract CD and co-author

Background

The primary objective was to evaluate the efficacy of a package of interventions targeted at HIV-positive pregnant women and their children, combining 1) a peri-partum ARV intervention: ZDV plus NVP and 2) a post-partum intervention. The post-partum intervention was the systematic proposal of safe and appropriate infant feeding methods and proper case management of infected children born to HIV-positive mothers. The long-term objective was to describe the uptake of alternatives to pro-

longed and predominant breastfeeding in HIV-infected women enrolled in the DITRAME PLUS project, in Abidjan, Côte d'Ivoire.

Methodology

This non-randomised therapeutic cohort (n=1500) study was initiated in Abidjan in March 2001. The study included consenting pregnant women, age 18 years or more, who were HIV-positive and informed of their serostatus.

Peri-partum ARV intervention: Pregnant women from 36 weeks gestation to delivery: 300 mg ZDV bid orally and multivitamin supplementation, iron and folate, and malaria chemoprophylaxis. Intra-partum: 600 mg ZDV and 200 mg NVP once orally, self-administered at home; Children: ZDV syrup 2 mg/kg 6 hourly for seven days and NVP: single dose 2 mg/kg on Day 2.

Post-partum intervention: Systematic proposition from 36 weeks of gestation of two alternatives to prolonged breastfeeding (the common practice in Côte d'Ivoire): formula feeding (FF) from birth (with a drug inhibiting lactation) or exclusive breastfeeding (EBF) with early cessation from three months of age; vitamin A supplementation; postnatal contraception systematically proposed; assessment of HIV infection in children performed until two months after complete cessation of breastfeeding. HIV-infected children received cotrimoxazole from six weeks until at least one year. All services were provided free, including formula from birth or time of weaning to nine months; follow-up was for 2 years.

Nutritional counselling was provided by nutritionists: pre-partum – explanations of the proposed interventions; at follow up – information on benefits of BF, risks of mixed feeding, specific counselling during weaning, regular "workshops" to learn how to cook baby food.

Follow up occurred at birth, second day of life (D2), weekly to 6 weeks, monthly to one year, quarterly to 2 years; documentation of clinical events and actual IF practices (data collected by independent counsellors to minimise bias, 7-day recall, in detail).

Results

From March 6–May 31, 2001: 323 HIV-positive pregnant women were enrolled, 266 of whom delivered: 252 singletons (1 stillbirth), 12 pairs of twins; 2 triplets (1 stillbirth). All but one (0.4%) expressed their infant feeding intention before delivery: 151 (59%) chose FF from birth and 104 (41%) planned to breastfed.

Those who did not choose FF before delivery were more likely to be living with their partner or a co-spouse (ORs [CIs]] 2.4 [1.3–4.5] and 2.1 [1.1–3.9], respectively), and have no schooling (OR 3.8 [1.7–8.6].

Only one of 229 women made no pre-delivery IF choice: 134 (59%) chose FF and

IF practice at D2 post-partum	Prenatal choice	
	FF, n (%)	BF, n (%)
Formula feeding (FF)	123 (82)	3 (3)
Exclusive breastfeeding (EBF)	8 (5)	54 (52)
Predominant Breastfeeding (PBF)	14 (9)	46 (44)
Mixed feeding (MF=breast+formula)	6 (4)	1 (1)
TOTAL	151	104

94 (41%) BF. Of those who, before delivery, had said they would FF, 82% were doing so on Day 2.

Of those who said they would BF, 57% were EBF on D2 and 39% predominantly breastfeeding (PBF). Including deaths and loss to follow up, of those who were FF on D2, 80% were still doing so after 1 month and 69% after 3 months. Of those who were EBF on D2, 50% were still doing so after 1 month and 22% after 3 months. Of those who were PBF on D2, 62% were doing so after 1 month and 32% after 3 months.

### **Conclusions and recommendations of authors**

The authors present the following conclusions: 1) uptake of the intervention was

high; 2) nearly all women expressed their choice before delivery; 3) FF was better accepted than anticipated (about 60%); 4) women living with their partner or a co-spouse or who had had no education were less likely to choose FF; 5) for women who chose FF, postnatal compliance with their prenatal choice was high, and failures were mainly related to their partner or family environment; 6) for women who chose BF, EBF seemed to be difficult to achieve beyond the first weeks of life, with more than one-third of the breastfeeding mothers practicing PBF, or some degree of mixed feeding, as early as D2; 7) weaning as early as 3 months is probably not acceptable that early, possibly because of stigma, but there is no evidence given for this conclusion; and 8) completion of follow-up will allow assessment of: acceptability of the nutritional interventions, incidence of postna-

tal HIV transmission according to feeding practice, and incidence of severe morbidity/mortality according to feeding practice (including time of weaning). The authors stress that there is an urgent need to find innovative approaches to involve fathers in pMTCT interventions and to reduce stigmatisation of people living with HIV/AIDS.

### **Methodological considerations/ reviewer's comment**

Assessment of feeding practices was thorough, although 7-day recall may overestimate EBF rates; little evidence has yet been presented in relation to early weaning; reasons for changing feeding practice were not well documented.



# HONDURAS

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## Rapid Assessment of pMTCT in Honduras (Baek et al, 2002)

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### Document title

Report on the Qualitative Rapid Assessment of the UN-Supported PMTCT Pilot Program in Honduras

### Authors

Baek C, Rodriguez MX, Escoto LR

### Institution

Population Council/HORIZONS Project

**Date** December 2002

**Country** Honduras

### Document type

Program evaluation (under review, not for circulation)

**Source** UNICEF Headquarters

## Background

This report summarizes a rapid assessment of UNICEF's pMTCT pilot project in Honduras, the second poorest country in Central American, with a population of 6.5 million. Honduras has 17,199 registered HIV/AIDS cases, predominantly in urban areas, with a prevalence rate of less than 1% to 5%. Additionally, 690 children under 5 have AIDS, which is 5% of the total cases. Approximately 95% of these children have acquired AIDS through vertical transmission. The Honduran Ministry of Health and UNICEF began implementing a pMTCT pilot project in 1999, becoming the first country in Latin America and the Caribbean to implement such a project. In less than 2 years, 40 sites were established. This rapid assessment is the first in Honduras, and was undertaken as part of a global evaluation of UN-supported pMTCT pilot

program experience, managed by the Population Council. The assessment was conducted in order to contribute to the preparation of a practical programming framework, including scaling up strategies. Lessons learned and best practices derived from the evaluation will help form the basis for the large-scale expansion in Honduras. The goal is to have a national program by the end of 2003.

## Methodology

Several factors resulted in the rapid assessment being reduced to the use of only qualitative methods. It was conducted over a one-week period, between August 26-30, 2002. Meetings and interviews were held with national stakeholders, regional managers, site managers, providers, and clients. Most of these interactions were informal and without the use of formal questionnaires. The type of information acquired is similar, however, to that collected in Zambia and Rwanda, since the questions were based on the evaluation instruments used in those countries. The evaluation team visited sites where pMTCT programs had been established for the longest period of time, a total of 6 sites in 3 areas of the country. A site questionnaire was carried out to ascertain services provided and referrals available at five out of the six sites. Other information collected ranged from provider commitment and motivation to issues of confidentiality and training. Issues related to the integration of VCT in ANC/MCH programs and infant feeding counselling were also examined. Family planning, care and support, supplies, monitoring and evaluation, communication strategies, male involvement and transitioning from a pilot to national programs were explored. Re-

sults and conclusions are limited to assessment findings relevant to infant feeding counselling.

## Results

The Honduran pMTCT Program promotes formula feeding. A decision was made early in the implementation to simplify the counselling component for both providers and clients, apparently reducing difficulties experienced in other pilot programs. Although the program protocol outlines several options (exclusive breastfeeding, heat-treated milk, wet nurse, and breast milk substitutes), and indicates that the individual woman should make the decision regarding infant feeding without any pressure (following WHO recommendations of informed choice), in practice, there is a bias toward promoting formula feeding for HIV-positive clients. Informants state that this is due to program preference as well as some providers' lack of knowledge regarding the probability of transmission through breastfeeding.

Breastfeeding is discouraged and the safety and feasibility of formula use are assessed during the counselling session. Currently, the pilot program distributes formula free for 6 months. These factors are thought to contribute to the high percentage of HIV-positive patients choosing formula. From November 2000 to June 2002, 30 out of 30 HIV-positive women chose formula feeding.

Bottle feeding is widely accepted culturally. There is no stigma attached to a woman who has decided to use formula. Consequently, providers reported that HIV-positive clients are using formula without prob-

lems, and there were no reports or suspicions of mixed feeding due to cultural pressures or fear of stigma. The program seems to have introduced infant formula for HIV-positive women without adversely affecting other women's potential to breastfeed exclusively. HIV-negative women and those of unknown status are encouraged to breastfeed throughout the country.

Obvious spillover was not reported to be a problem. Providers indicated that they were concerned about this at the outset of the project but have not witnessed women who are HIV-negative or of unknown status requesting formula. Some sites have reported that infant formula is never mentioned during HIV pre-test counselling sessions, but only mentioned to HIV-positive women during post-test counselling. HIV-negative women are encouraged to breastfeed exclusively, and are not told of the distribution of formula. This strategy was developed in consultation with members of La Leche League, who were concerned that

the introduction of free formula in ANC/MCH settings and could undermine breastfeeding in the general population.

Providers and stakeholders view infant formula as an important part of the pMTCT program. A consensus among all the providers and stakeholders was that infant formula should continue to be provided. The change in UNICEF's policy to no longer procure and donate formula (to be implemented February 2003) presents a challenge. The inter-institutional committee is requesting that the government take responsibility for the free provision of formula. Providers at one site expressed serious concern that if formula cannot be provided, they will not be seen as credible, and their motivation to support this program will decrease sharply.

### **Conclusions and recommendations of authors**

Authors conclude that at some sites infant

feeding options are not discussed prior to HIV testing. Only women who are HIV-positive are counselled to formula feed their infants. All HIV-negative women and those of unknown status are encouraged to breastfeed exclusively. This approach is thought to decrease potential spillover of infant formula uptake by the general public and has been recommended by the pilot programs as part of the national pMTCT scaling up strategy.

### **Methodological considerations/ reviewer's comment**

Authors note that the report comes out of an informal, one-week assessment, consisting of very brief site visits. Information collected on infant feeding provides very useful insights and should help program planners improve training related to infant feeding options and anticipate potential problems related to the supply of free or subsidized formula when the program is expanded.

# INDIA

## Rapid Assessment of pMTCT in India (Sarna, 2002)

### Document title

Report on Discussions with National AIDS Control Organization and Visits to Two Pilot Program Sites

**Author** Sarna A

### Institution

Population Council/HORIZONS Project

**Date** December 2002

**Country** India

### Document type

Program Report (under review, not for circulation)

**Source** UNICEF Headquarters

## Background

India is still considered to be a low-prevalence country (0.7%), estimated to have around 3.8 to 4 million persons infected with HIV, the second largest number of people living with HIV/AIDS (PLHA) in the world after South Africa. In these high-prevalence states, the epidemic is already showing signs of spreading into the general population, with prevalence among the antenatal clinic attendees ranging between two and 2.5% in five states. The pMTCT program, in the form of feasibility studies with AZT and then NVP, has been ongoing in India since April 2000. This summary reports on the findings of a rapid assessment of UNICEF-supported pMTCT pilot projects around the world, conducted by Horizons/Population Council in July 2002. In India, this assessment is meant to complement a quantitative feasibility study on the short course AZT intervention for pMTCT, conducted by The National AIDS Control Organization (NACO).

## Methodology

Informal visits to a non-representative sample of sites (two out of eleven) and very few interviews were used to collect information. All key informant, health provider and client interviews were informal and without questionnaires, meant to collect qualitative information on actual experiences and lessons learned. Questions were based on evaluation instruments created for the global evaluation so that the information acquired is similar to that from the other three countries (Honduras, Rwanda and Zambia).

## Results

Infant feeding counselling forms an important part of the pMTCT program in India. The official NACO policy is to promote informed choice by the mother. The message on infant feeding is initiated early, during pregnancy itself and at the time of pre- and post-test counselling. All members of the participating AZT research team reinforce the same message at the time of delivery.

Mothers are informed about the risk of MTCT through breast milk, the benefits of breast milk, and the risks and benefits of replacement feeding.

IF counselling emphasizes exclusive breastfeeding with early weaning between 4–6 months to be done as quickly as possible, when breastfeeding is the IF method chosen by a mother.

Given higher mortality documented among babies who receive replacement feeds in the AZT feasibility study, emphasis is placed on promoting exclusive breastfeeding. All

counsellors interviewed believed that EBF was the best choice for both HIV-positive and HIV-negative women.

Socioeconomic factors affect IF decisions. Several clients indicated that they choose to breastfeed because they did not have means to boil or sterilise utensils or afford cows' milk. Clients appeared to be aware of the importance of EBF.

Modified cow or buffalos' milk is the only replacement feed being offered as an alternative to breastfeeding. Mothers in one site receive a demonstration on how to prepare the feed (sterilisation, dilutions, etc.) and use a bowl and spoon instead of a bottle. No nutritional supplement is added to the milk.

There is a general reluctance by providers to promote or offer formula as a choice, given the low levels of education and low socio-economic status of women using public sector facilities. Formula is only offered as a choice to women who ask for it or appear to be able to afford it.

Other choices such as milk banks, heat-treated breast milk and wet nursing are not discussed at all.

## Conclusions and recommendations of authors

Success reported by the two AZT and then NVP studies in India indicates that the pilot pMTCT program is ready for scale-up to the district level in the high-prevalence states. Prevention of MTCT services, including VCT, has been integrated into the antenatal care program quite successfully, despite several resource constraints at these sites. A rapid scale-up, however, has sev-

eral challenges and the program will need to establish monitoring and supervision systems, upgrade MCH facilities and ensure the adequate training of human resources. There are no specific conclusions drawn or recommendations made by the authors concerning infant feeding counselling or follow-up, although general scale-up issues apply to this component of the pMTCT program as well.

### Methodological considerations/ reviewer's comment

Authors note that the report comes out of an informal assessment, consisting of key informant interview and 2 very brief site visits. Information collected on infant feeding provides very useful insights, however, and should help NACO and other program planners in designing the scale-up strategy, especially the training and counselling components.

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## HIV Child Survival Project (South India AIDS Action Programme et al, 2001)

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### Document

Karu: Chennai HIV child survival project—Report of a situational analysis

### Authors

South India AIDS Action Programme, Community Health Education Society, Tamil Nadu Dr MGR Medical University, Macfarlane Burnet Institute for Medical Research and Public Health, International Health Unit

### Institution

South India AIDS Action Programme; Community Health Education Society; Tamil Nadu Dr MGR Medical University; and the Macfarlane Burnet Institute for Medical Research and Public Health, International Health Unit

**Date** August 2001

**Country** India

### Document type

Report, Funded by the Australian-India Council

### Background

With a population of over 60 million, Tamil Nadu, India, has been identified as a state with significant levels of HIV infection. Recent studies indicate a rapid spread of HIV among women of reproductive age. There are some areas in Tamil Nadu where prevalence is up to 3%, representing 400,000 to 500,000 women. Pioneering interventions, such as voluntary counselling and testing and antiretroviral prophylaxis with avoidance of breastfeeding for those women found to be positive, have been established in the Tamil Nadu Dr MGR Medical University. The government of India, with support from UNICEF, established

three pilot studies in public hospital settings. These interventions raised important questions concerning issues of informed consent, confidentiality, stigma, and adequate alternatives to breastfeeding. Most infected women do not know their status and many prefer not to be tested. This project aimed to address the needs and concerns of women in relation to pregnancy and breastfeeding, and to contribute to the development of strategies to care for and support women and families with infected babies.

### Methodology

This collaborative project, which ran between January and August, 2001, was considered a situational analysis focused on knowledge, attitudes, and practices (KAP). Qualitative research methods were used, including 22 in-depth interviews and 36 focus group discussions (FGDs) involving eight to twenty participants. Urban, semi-urban, and rural settings in the districts contiguous to Chennai were included, as well as Chennai City. Staff and volunteers familiar with the communities facilitated the group discussions. Participants included: women in prostitution, unmarried girls between 16 and 22 years, married women, pregnant and lactating women living with HIV, couples between 25 and 35, mothers-in-law, nurse trainees, dai (rural traditional midwives), female health workers (VHNs), mail volunteers, pharmacists, youth and student groups, husbands of women living with HIV, truck drivers, and doctors. Consultations were held with officials and community leaders. KAP issues included: pregnancy and antenatal care, breastfeeding and replacement feeding, sexually transmitted infections, HIV/AIDS, safer sex practices including condom use,

mother and child health, expectations in marriage and pregnancy, care of sick babies, and discrimination against people infected/affected with HIV/AIDS.

## Results

Knowledge, attitude, beliefs about HIV/AIDS: Knowledge of HIV among health care workers varied greatly (sexual transmission, MTCT, prevention, and condom use). Rural health workers, including pharmacists and dai, lacked clarity and place more stress on blood as a source of transmission. Urban nurses expressed fear of handling HIV-positive patients who were sick, a potent indicator of stigma. Community knowledge of HIV transmission was better in urban settings. Rural people had less general knowledge and more difficulty in understanding the difference between HIV and AIDS. Many believed that HIV can be transmitted casually.

Discrimination: Urban participants expressed a range of factors associated with discrimination and prejudice, with distressing reports from people infected with HIV concerning stigma. Transmission was often equated with misbehaviour and immoral behaviour, leading to a lack of recognition that faithful married women may be at risk of HIV from their husbands. Discrimination of people with HIV at the family level ranges from ostracizing PLWHs by giving them separate plates and tumblers to total rejection and failure to participate in the rituals of dying and death. Urban participants explained that discrimination only occurs when confidentiality is breached, stressing that it was common among health care providers. Doctors revealed that it was based on fear of becoming infected through occupational exposure. Gender is

an important factor. Both men and women are discriminated against when they are known to be HIV-positive, but women more so from their families. Also, becoming a widow causes discrimination given their low status. Relatives often take belongings following a husband's death.

Sexual health and relationships: The expectations of women from marriage were affection, sex, income, respect, security, to be understood, and to love and be loved. When asked about testing for HIV before marriage, many women expressed agreement, but said it was a difficult issue requiring community consensus. There is great societal pressure to conceive soon after marriage, with rural women stating that it was best to conceive even if they were HIV-positive or had a congenital illness. For men, sex outside of marriage is common. Women feel both angry and resigned about this behavior. Couples have sex throughout pregnancy, up to 4 or 5 days before delivery. Most participants were uncomfortable talking about safe sex, which was generally only associated with using condoms and being faithful. If other birth control methods were being used, then condoms were associated with mistrust. Rural participants said that condoms were never used when a wife was pregnant. Married urban women felt that it is a man's duty to wear a condom but they could not ask him to use one.

Pregnancy: Most of the women expressed a desire to stay in their own mother's house during pregnancy, depending on such factors as the order of pregnancy, socioeconomic level, and the relationship between the woman and her mother-in-law. Since mothers-in-law and mothers have great influence on decisions during pregnancy,

the need to address messages and information about parent to child transmission (PTCT) to older women as well as younger women. Participants indicated that many men do try to help in domestic chores and a few accompany their pregnant wives to the clinics and inquire about their health. The great majority of pregnant women attend antenatal care and also receive home visits. The majority of women deliver in hospitals or health centres. Induced abortion is legal in India, and the possibility of terminating a pregnancy because of HIV has begun to be considered in these communities. The decision to terminate is usually made by the husband or mother-in-law.

Infant Feeding: In general, participants believed that breastfeeding is necessary and beneficial. The hazards of not breastfeeding were also recognised. It was expected that mothers will breastfeed unless she they are sick or have no milk. Those who do not breastfeed are likely to receive some pressure to do so. Breastfeeding practices are not optimal given prelacteal feeds, early introduction of foods and other liquids, and the early cessation of breastfeeding. Babies are put to the breast soon after delivery and colostrum are generally given. Those who mentioned duration of breastfeeding indicated one to two years. Many women introduce cow's milk, given by bottle, in the early months as a supplement. Many thought infant formula to be too expensive and would give diluted fresh liquid cow's milk or diluted dried milk powder. Weaning foods unsuitable for an infant were also mentioned and included Cerelac, Nestum, and millet porridge. Sometimes milks were over- or under-diluted. Sugar and micronutrient supplements were not added. The idea of expressing and boil-



ing breast milk was completely unfamiliar or considered not practical. Participants mentioned the need to clean bottles but not sterilise them.

#### Impact of HIV and infant feeding counseling:

According to health professionals and HIV-positive women respondents, HIV-positive women are currently being advised not to breastfeed. All participants talked about the difficulties involved if women are told not to breastfeed, including the practical (cost and time), social, and emotional reasons. Most women felt that it was dangerous to not breastfeed and worried that if they followed the doctor's advice that the baby would become ill with fever or diarrhoea, or die. Women mentioned the social difficulties and discrimination they would face if they did not breastfeed.

Childhood illnesses: Rural groups view the mother as the primary caregiver when a child is sick. Urban women mentioned other family members that might care for a sick baby if the mother was unable to. Mothers usually try home remedies and prayer before seeking medical attention. For prevention of childhood illnesses, many women mentioned nutrition, immunisation, medical check ups, and child spacing. When a child is ill, the mother is often blamed by her husband and mother-in-law. Respondents indicated that care and support to mothers of sick babies is needed. Messages

need to encourage empathy and support for mothers rather than blame.

#### **Conclusions and recommendations of authors**

This study provided a wealth of information that can be used to inform the design and implementation of prevention and care strategies in relation to pMTCT. The results are relevant to other areas of India. The authors conclude that promoting a "child survival" approach—rather than the current focus on counselling and testing during pregnancy, provision of anti-retroviral prophylaxis and infant feeding counselling—will lead to a broader response to the epidemic and greater impact on mothers and children. A "child survival" approach emphasises the need for balance in counselling women about infant feeding so that they can make the safest choice for their own circumstances. The study highlights the need to provide follow-up care and support for HIV-positive mothers, and advocate for these women to receive antiretroviral therapy, rather than just prophylaxis. Informed consent and confidentiality need to be addressed in the context of antenatal HIV counselling and testing. Involvement of husbands in counselling before testing for HIV needs to be explored, along with the concept of "couple visits" as a routine part of ante-natal care. Other recommendations include interventions at

the level of the family and community to address issues of safe sex within arranged marriages, including condom use. There is an urgent need to provide training about the true risks of exposure to HIV and how to minimise them. Medical providers, who continue to be potent generators of stigma, need access to post-exposure prophylaxis so that their fears are addressed. Exclusive breastfeeding is rare and both prelacteal feeds, which have spiritual or symbolic meaning, and the early introduction of rice feeds for fear of insufficient milk production, must be addressed in order to make breastfeeding safer.

#### **Methodological considerations/ reviewer's comment**

Strengths: Training of collaborating institution researchers and use of participatory methods appear to have strengthened the response of participants and analysis of FGDs. The inclusion of both younger and older women provided an historic perspective on key issues.

Limitations: Description of the research process is limited. In-depth interview questionnaires, FDG guides, and instructions to interviewers and facilitators are not provided for review. Consequently, little comment can be made concerning the quality of the instruments and methodology.

# KENYA

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## Maternal Knowledge of MTCT and Infant Feeding Practices (Oguta et al, 2001; Oguta, 2001)

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### Document title

- 1) Maternal knowledge of MTCT of HIV and breast-milk alternatives for HIV positive mothers in South-Western Kenya
- 2) Infant feeding practices and breast milk alternatives for infants born to HIV-infected mothers in Homa Bay District

### Authors

- 1) Oguta TJ, Omwega AM, Sehmi JK.
- 2) Oguta TJ

### Institution

Applied Nutrition Programme, Dept of Food Technology & Nutrition, University of Nairobi

**Date** 1) 2001. 2) 2001

**Country** Kenya

### Document type

- 1) Unpublished report. 2) MSc Thesis

**Source** ESARO CD

## Background

More than 300,000 babies are at risk of HIV infection per year in Kenya. The aim of the study was to assess 1) maternal knowledge of MTCT, 2) infant feeding practices, and 3) the viable alternatives to breast milk and conditions surrounding the choice of infant feeding methods in rural South-Western Kenya.

## Methodology

This was a cross-sectional exploratory study of women of unknown HIV status with babies aged 0-12 months and a sub-group of HIV-positive women with children up to two years. The area for the study was chosen because of its high HIV prevalence and infant mortality rate and for being a pilot site for the national pMTCT programme. Villages (25) were randomly selected and mothers recruited consecutively.

Data collection consisting of semi-structured questionnaires were administered to 112 women; also held were 4 focus group discussions (two with eight women age 18-45 and two with eight men age 20-54); key informant interviews with 5 experienced women; observation (using observation study guide) of IF practices of 11 HIV-positive women; and four case studies: two HIV-positive women (one formula feeding, one breastfeeding), and two women of unknown status (one using cow's milk, one using a wet nurse). A scoring system was developed for knowledge of MTCT.

## Results

Only 9% of women answered all six questions on MTCT correctly; 46% had "average" knowledge. It was thought that all babies of HIV-positive women are infected and that this is not preventable. HIV-positive women were more knowledgeable.

All except two of the HIV-positive mothers were breastfeeding "because they did not know their status early enough". Of the mothers of unknown HIV status, 98% were breastfeeding, none exclusively. Median duration of breastfeeding was 23 months.

Alternatives to breastfeeding: Cow's milk was most acceptable (mentioned by 85%), but (if have no cow) expensive (up to 45% of income); very few mothers knew of the need for modification of whole cow's milk; wet nursing was acceptable for older but not younger women (common for orphans, not for babies of healthy mothers); formula was considered "good" but unaffordable; goat's milk/expression of breast milk/milk powder were rarely mentioned; expression of breast milk was considered unacceptable.

Knowledge about MTCT: More knowledge about MTCT 1) had no effect on initiation, frequency or duration of breastfeeding; 2) was associated with earlier introduction of complementary feeds (author's suggestion: because more knowledge was also associated with more education, higher income, and the likelihood of the mother doing "business"); 3) was associated with more consideration of alternatives to breast milk; and 4) was linked to less social rejection of non-breastfeeding mothers.

## Conclusions and recommendations of authors

The level of knowledge about MTCT is very low. Cow's milk is the most viable alternative to breast milk. Wet nursing is viable at the family level according to mother of unknown status (not among HIV-positive mothers).

Recommendations include: 1) intensify educational efforts about MTCT in general and exclusive feeding in particular; 2) improve primary health care coverage; 3) improve water and sanitation, 4) improve ac-

cess to cow's milk and knowledge about modifications required; 5) encourage community-based care and feeding of orphans; 6) incorporate infant feeding counselling into all HIV/AIDS counselling and BFHI programmes; and 7) reduce stigma.

## Methodological considerations/ reviewer's comment

A study guide and scoring system were developed to standardise the research technique. The observational study methodology was not reported.

This study was largely of intentions. The author considers unmodified cow's milk a potential infant feeding option. The potential for increasing (or changing attitudes of mothers towards) exclusivity of breastfeeding was not explored. The degree of support for wet-nursing is interesting, perhaps important, but the consideration of (possibly repeated) HIV testing of the wet nurse to confirm HIV negativity was not explored, though it was recommended.

# MYANMAR

## Country Adaptation of Global HIV/ IF Guidelines: Stage I (Williams, 2001)

### Document title

Country Adaptation of Global HIV and Infant Feeding Guidelines and Development of Replacement Feeding Guidelines for Myanmar, 2001-2002. Stage I: Review of currently used infant feeding guidelines and information on infant feeding practices in Myanmar

**Authors** Williams C

### Institution

National Nutrition Centre and National Aids Programme, Myanmar, UNICEF; Centre for International Child Health, Institute of Child Health, London

**Date** December 13, 2001

**Country** Myanmar

### Document type

UNICEF Consultant Report

**Source** UNICEF Myanmar

## Background

The 1998 WHO/UNAIDS/UNICEF Guidelines on HIV and Infant Feeding need country adaptation to the food items and feeding practices that are locally available, affordable and acceptable in Myanmar and that can be prepared safely in the typical domestic environment. This review is the first stage in a project to develop replacement feeding guidelines for Myanmar.

## Methodology

Methods used to conduct this study included the review of published studies and internal field reports, and meetings with

key informants, including mothers in Yangon.

## Results

Current policies: The National Breastfeeding Policy adopted in 1993 approximates the Baby Friendly Hospital Initiative's (BFHI) 10 steps, but additionally prohibits advertisements for and free gifts of breast milk substitutes (BMS), and recommends that the duration of exclusive breastfeeding be for four months and encourages breastfeeding up to at least two years of age. At 4–6 months rice, banana and papaya are to be introduced; at seven months meat, fish, beans and vegetables; at 10–11 months egg; and at 12 months family pot. A 1998 national consensus meeting endorsed the 4-month EBF goal (rather than 6) for several reasons, including the capacity of undernourished mothers and maternity leave constraints. The "Code" has not yet been incorporated into national law; formula is rarely labelled in local languages, and private and children's hospitals accept donations of BMS. Other breaches of the Code are also common: HIV-positive mothers near Thailand are believed to cross the border to obtain free supplies of BMS from Thai PMCT programmes.

Other factors that may affect policy: The Baby Friendly Hospital Initiative (BFHI) has been extended to home deliveries and private clinics through the Baby Friendly Clinic Initiatives.

Breastfeeding: Most women feed colostrum; prelacteal feeding is unusual and demand feeding normal—all a big change from earlier (probably a result of the BFHI

but still often not the case in private hospitals or in all parts of the country). EBF rates were very low (16% of mothers practised EBF at 0–3 months) because of giving water (seen as necessary for thirst and cooling). However, BF is prolonged: 89% were breastfeeding at 12 months and 67% at 20 months. Reasons for early cessation (which is uncommon) include pregnancy, work and refusal of breast.

Complementary food: Timing of introduction of complementary food (CF) is poor at both ends of the age spectrum: 40–50% of infants are given CF too early (at less than 4 months), and 15% start CF too late: at over 9 months. Early introduction is related to traditional beliefs in the importance of rice as protection and as being good for health and growth. Rice (meshed through cloth or pre-chewed) is always given first, sometimes salt is added but seldom oil (as recommended). No clear pattern was seen thereafter. Malnourished children (compared to well nourished) are fed rice at less than 4 months, given insufficient food of no variety infrequently, in a context of poor hygiene practices. The liquid portion of soup (low nutrient density) is commonly given to babies. Milk of any kind is rarely mentioned as an adjunct to complementary feeding. Stunting prevalence was 22% at 6–11 months and 37% at 12–23 months.

In Yangon, 70% of mothers work, mostly away from home and the baby; in rural areas mothers are more involved in feeding and caring for children. Domestic hygiene (e.g., hand washing) is often poor, and rice is often left for up to 4 hours before feeding.

## Conclusions and recommendations of author

The BFHI has improved breastfeeding initiation practices, but EBF is rare due to the very early giving of water. Complementary foods are often of low quality (energy and other nutrients) and given infrequently. Prolonged breastfeeding substantially makes up for this. Feeding babies without breast milk and with limited access to infant formula or animal milks will be very difficult.

## Methodological considerations/ reviewer's comment

This was preliminary work before a qualitative field assessment of infant feeding practices.

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## Country Adaptation of Global HIV/IF Guidelines: Stage II (Williams, 2003)

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### Document title

Country Adaptation of Global HIV and Infant Feeding Guidelines and Development of Replacement Feeding Guidelines for Myanmar, 2001-2003. Stage II: Formative research and development of replacement feeding guidelines for site 1: Monywa

**Authors** Williams C, Zin MM, Mon AA

### Institution

National Nutrition Centre and National Aids Programme, Myanmar, UNICEF; Centre for International Child Health, Institute of Child Health, London

**Date** January 2003

**Country** Myanmar

### Document type

UNICEF Consultant Report (under review, not for circulation)

**Source** UNICEF Myanmar

## Background

The 1998 WHO/UNAIDS/UNICEF Guidelines on HIV and Infant Feeding need adaptation to reflect country conditions and the food items and feeding practices which are locally available, affordable and acceptable and which can be prepared safely in the typical domestic environment. This paper presents results from formative research of infant feeding options for HIV-positive mothers at one pMTCT site in 2002.

## Methodology

Rapid appraisal techniques, dietary recall and household trials of improved practices (TIPS) were used. Attitudes towards Safer

Breastfeeding had been explored during stage 1, and this was used to develop guidelines that were consumer-tested in stage two. TIPS were conducted with women of unknown HIV status only to avoid disclosing the status of infected mothers.

## Results

Exclusive breastfeeding (EBF) was uncommon, with two-thirds of the infants receiving water (to quench thirst) by 2-3 months of age. Current feeding recommendations advise that infants begin complementary foods at 4-6 months, but there is traditional use of pre-lacteal feeds and a celebratory rice meal is given during first 7 days of life. Many mothers introduce rice between 2-3 months to make baby strong and resistant to mosquito bites.

Majority of mothers found the idea of EBF acceptable and commented that it was convenient, less time-consuming and saved money. However, a minority were unconvinced and worried that infant needed water and breast milk would not satisfy their hunger. Health workers had good knowledge of EBF but believed EBF rates were higher than they actually were.

Most mothers breastfed for at least two years, with most common reason for stopping being subsequent pregnancy. Many mothers applied bitter leaves to dissuade child, moved child out of their bed or separate from child. Most managed to stop breastfeeding over 3 days, but many complained that breasts became engorged when stopping. Mothers and health professionals reluctant to consider early cessation of breastfeeding, when child about 6 months of age, as this was considered cruel.



Although knowledge of expression to relieve distension was considerable, little community experience of expressed breast milk for storage to feed child later due to concerns about cleanliness. However, TIPS proved successful and mothers were amazed and delighted that there was a free way to feed their infant if they had to be separated.

Heat treatment of breast milk was possible and many homes had suitable pots. However, the fuel cost was an issue. Mothers suggested placing milk in cup in the middle of rice pot while cooking rice twice a day to conserve fuel.

Wet-nursing is common between household members, but concerns were expressed about wet-nursing in case of HIV infection.

If an infant could not be breastfed, mothers suggested using formula, rice, condensed milk, wet-nursing, cow's milk and tea, although many were aware of the health risks these carried. Health professionals suggested formula feeding by bottle, or powdered milk, cow's milk or wet-nursing, but many considered financial constraints, followed by access to clean water and fuel as major obstacles. Senior professionals felt mother could only safely replacement feed if they could afford to buy formula.

Rice was the most frequently suggested alternative food after cessation of breastfeeding, since infant formula is considered too expensive. Less than half of the health professionals were aware that a child from 6–12 months who is not breastfed still needs milk/milk products in addition to complementary foods.

Modified cow or other animal milks were considered too complicated to prepare several times a day and no household was using powdered milk. The trial of cup feeding was successful, but many mothers were already using soup spoons to feed infants with water anyway. Trial of boiling water for infants met with resistance. Mothers were not boiling water and reported no problems associated with this and therefore are reluctant to invest time and fuel.

Heat-treated expressed breast milk is considered feasible and acceptable, possibly in combination with other milks, or during cessation, mostly because of low cost and fulfilling desire to breastfeed. However, health professionals lack confidence in expression as an option and may require further training and support.

Replacing breast milk is potentially problematic and considerable confusion between powdered milk and formula is considerable. Reluctance to boil water for infants is also considerable. Many are aware of the health risk of feeding non-human milks. Infant formula is very expensive, but is considered by senior staff to be the preferred option of HIV-positive women, with cost the main barrier.

Staff believe mothers can be taught how to prepare formula safely and feel it should be provided free as part of pMTCT programme. (Please note that there is no local infant formula, and imported brands are labelled in English, Chinese, Malay or Thai, not Burmese.)

Few have experience feeding infants animal milks but TIP suggested that cow and goat milk may be an acceptable option for some mothers and very likely to be an option after cessation. However, many fami-

lies regarded this as expensive and are likely to use it in combination with heat-treated breast milk.

Local powdered milk is not thought to be suitable for infant feeding, but more details of nutrient composition are needed.

Wet-nursing is complicated by the need to test wet-nurse and ensure she remains uninfected.

Conditions are favourable for introduction of EBF as an option, since there is already some community experience. EBF practice needs to be strengthened and a mass outreach campaign may be required.

Little community experience of early cessation of breastfeeding, but some experience of managing cessation at later stage. HIV-positive mothers who are considering this option will need adequate support and counselling.

## Conclusions and recommendations of authors

The global guidelines for HIV/IF should be modified for Myanmar to reflect the findings of this formative research, which was designed to explore infant feeding options.

## Methodological considerations/ reviewer's comment

This was a detailed study of current practices and attitudes, plus trials of improved (alternative) practices, which greatly informed the development of guidelines for use in this area. Great detail is also provided on improved complementary feeding, which has not been included in this summary.

# NIGERIA

## Early and Abrupt Cessation of BF in Nigeria (Isiramen, 2002)

### Document title

Early and Abrupt Cessation of Breastfeeding In The Nigerian Context: Is This An Option For HIV Positive Women?

**Author** Isiramen V

### Institution

Institute of Child Health, University College, London; Ahmadu Bello University Teaching Hospital, Kaduna, Nigeria

**Date** August 2002

**Country** Nigeria

**Document type** MSc dissertation

**Source** Author

### Background

The Nigerian national HIV seroprevalence rate is 5.8%, and that of Kaduna, Nigeria is 8.1%.

The aim of the study was to: 1) define and explore the process of early and abrupt cessation of breastfeeding in the Nigerian context; 2) find out how HIV-positive mothers can be supported by health workers in this practice; and 3) use the information gathered to improve the effectiveness and acceptability of messages and services for MTCT prevention in Nigeria.

### Methodology

This was a cross-sectional qualitative (using focus group discussions [FGD] and key informant [KI] interviews) and quantitative (structured directed questionnaires) study. Qualitative study: Two FGDs were held with eight women in each, age 18-38. Their edu-

cations ranged from 6-16 years (mean 10.6). KIs (18) were held with health workers. The site was the Departments of Paediatrics and Obstetrics, Ahmadu Bello University Teaching Hospital, Kaduna, Nigeria, designated as one of three proposed national pMTCT sites.

Subjects were health workers (all HIV/AIDS counsellors or lactation managers: five paediatricians, four obstetricians, two nutritionists, two midwives, two paediatric nurses, one research/community nurse, two community health workers) and women who attended paediatric outpatient clinics at the teaching hospital and have one other child that they had breastfed.

Questionnaires were administered in English and FGDs were conducted mostly in English.

### Results

Quantitative Study: 60 participants were aged 18-42 (52% 24-30, mean 31); 85% had 4-19 years of education and 15% had no education; Islamic and Christian; Age of weaning (meaning no breastfeeding): 3-24 months (mean 15-16); Age of this child: 2 weeks to 2.5 years (mean 9.1 months); Age of previous child: 9 months to 10 years (mean 4 years).

Feeding practices: Predominant breastfeeding (PBF, defined as introduction of other liquids at less than 1 month) was 48%; exclusive breastfeeding (EBF) was 33% at 4-6 months; mixed feeding (breastfeeding plus introduction of other milks or cereal) was 19% at 4-6 months. More education was associated with more EBF.

Weaning practices: 81% had weaned at 12-18 months (mean 16 months); 38% achieved weaning within one day; 20% within 2-3 days; and 26% within 7-14 days.

How weaning was achieved: Weaning was achieved by applying something to the breasts, taking the child to a relative, giving other food or milk (41%), decreasing the number of breastfeeds (26%), or 'nothing special' (22%).

Reasons for weaning: Babies were weaned because they were considered old enough (51%), to encourage the infant to eat and to eat other foods, refusing the breast, mother going to work, and advice from others. No mother mentioned worry about HIV infection as a reason for weaning. Only two women re-lactated after weaning.

Problems weaning: 56% had no problems; 30% had pain; 17% had engorgement; and 19% reported infant crying excessively.

Knowledge of MTCT: 14% had some knowledge of MTCT; 5% knew of MTCT through breastfeeding; and 91% knew of transmission by sexual intercourse.

Themes: Breastfeeding is "normal", important, nutritionally adequate. Other fluids are given because of thirst, "cleaning out the gut", abdominal pain, skin conditions. EBF is thought to cause thirst, is difficult and stressful. Mothers seemed very responsive to educational messages given by Baby Friendly Hospital-designated institutions. Mothers suggest that three months EBF is more practicable than six. Relatives make EBF difficult. Time for stopping breastfeeding coincides with the child walking and eating other foods (for boys

18 months [otherwise they will be "dull"], for girls 21 months).

Early weaning (generally defined as under 10 months) is unusual. Accepted reasons included pregnancy, refusal of breast milk and mother's ill health. Unacceptable reasons included mother's career and fashion consciousness.

Abrupt weaning (generally defined as occurring over 1-3 days) is preferred and most common. Abrupt weaning is achieved by sending the baby to a relative, mother staying out all day, giving the baby snacks and drinks, covering the breasts or putting bitter tasting substances on them, wearing a firm brassiere, mother decreasing fluid intake, expressing breast milk, using analgesics, balm, and having a "strong will". Health workers recommended weaning over 1-2 weeks.

Weaning foods: From 4 months babies received pap (porridge, various sorts) with or without soya beans, groundnuts, palm oil, crayfish, bananas, eggs, with or without sugar, commercially prepared cereals. By six months babies received adult diet of rice, beans, potatoes, yams but not milk.

Early abrupt cessation: Mothers wanted advice from health workers, were worried

about cost of replacement food, and did not mention stigma. Health workers considered abrupt cessation to be unethical and unacceptable; they would rather recommend/supply replacement feeds from the start. How to do it – many health workers do not even want to discuss early abrupt cessation, but suggestions related to cessation of breastfeeding included the need for: 1) good preparation – train health workers in infant feeding counselling, team work between physicians and nutritionists, free VCT, support groups, infant feeding counselling during pregnancy and infant feeding clinics; 2) support during EBF – make lactation managers available at initiation of breastfeeding, regular follow-up, breastfeed to the clock (not on demand), gradually increase the time between feeds, express breast milk into a cup (to get the baby accustomed to using a cup), pacify the baby with massage, rocking, talking, need to commit to a family planning method; 3) support during transition – someone else to care for the baby, hospital admission, and introduce replacement foods stepwise and in small quantities. Health workers recommended supportive brassiere, analgesics, diuretics, lactation suppressants and family planning. Mothers suggested psychological support, wet-nursing (how common this practice is not discussed), cow or goat milk (although in-

frequently used), and donated infant formula.

## **Conclusions and recommendations of authors**

There were low rates of EBF; abrupt early weaning occurs, is acceptable (if for the "right" reasons), affordable and feasible, but health workers do not accept it.

Author recommends: 1) training/research on infant feeding counselling, 2) more VCT availability, 3) anti-retroviral drugs, 4) HIV positive mother-friendly services, 5) provision of replacement food, and 6) research on the use of soya as replacement feed.

## **Methodological considerations/ reviewer's comment**

Study strengths: This was a careful exploration of practices and opinions regarding early abrupt cessation of breastfeeding. There was considerable experience of abrupt cessation.

Study weaknesses: The only mothers studied were those attending a teaching hospital. Mothers had little knowledge of MTCT.

# RWANDA

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## Rapid Assessment of pMTCT in Rwanda (Pham et al, 2002)

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### Document title

Report on the Rapid Assessment of the UN-Supported PMCT Initiative in Rwanda: Pilot interventions at Kicukiro, Muhura, and Gisenyi Health Centers

### Authors

Pham P, Musamakweri A, Stewart H

### Institution

Population Council/HORIZONS Project

**Date** December 2002

**Country** Rwanda

### Document type

Program evaluation  
(under review, not for circulation)

**Source** UNICEF Headquarters

## Background

This report summarizes a rapid assessment of UNICEF's pMTCT pilot project in Rwanda, where approximately 13.7 % of Rwandans aged 15–49 are HIV-positive (a conservative estimate) and where about 430,000 adults and 65,000 children were infected by the end of 2001. UNICEF began piloting PMTCT programs in April 1999 at the Kicukiro Health Center (KHC) and later launched two additional programs in Muhura (Byumba province) and in Gisenyi (Gisenyi province). UNICEF plans to expand to 40 sites by 2006. The Interagency Task Team on Prevention of HIV in Pregnant Women, Mothers, and their Children (IATT), which includes UNICEF, UNFPA, WHO, UNAIDS and the World Bank, are preparing to scale up pilot intervention and initiate other pMTCT interventions in Rwanda. This rapid assessment was conducted in order to 1) examine and document pro-

gress, experience, and lessons learned in the pMTCT pilot sites and identify key issues and challenges to scaling-up; 2) examine the mechanisms of collaboration, coordination, and linkage with bilateral and NGO partners; and 3) contribute to the preparation of a practical programming framework, including scaling up strategies and requirements for technical and resource supports. Lessons learned and best practices derived from the evaluation will help form the basis for the large-scale expansion in Rwanda. The research was undertaken by the National University of Rwanda with financial and technical support from the Population Council and UNICEF-Rwanda.

## Methodology

Six standard instruments were used to collect information from clients, providers, site managers and other pMTCT stakeholders at the three clinics from May 27 to June 11, 2002. Quantitative and qualitative methods were used to collect facility-based data on the quantity and quality of services; and qualitative information was collected from providers and clients related to program implementation, the supply situation, community reactions to the pMTCT program, and lessons learned on the successes and challenges. Two days were allocated at each site. A total of 30 clients and 34 providers were interviewed; 106 observations of 5 pMTCT services were held (ANC, VCT, IFC, GM and FP); and four focus groups were conducted.

## Results

The rapid assessment determined that, although the three pilot sites differ, they share some common successes and chal-

lenges. Because the Rwandan government wanted to put an HIV/AIDS initiative in place, the program has focused on rapidly rolling out pMTCT services so that there will be sites that offer pMTCT in each of the health districts. The program was launched, however, before national protocols and guidelines for voluntary counselling and testing (VCT), infant feeding counselling and other pMTCT services could be finalized and disseminated. basic support systems need to be strengthened, including training, communication (advocacy, BCC and community mobilization), and monitoring and evaluation of all pMTCT services.

Selected findings related to IF included 1) clients, in general, did not receive adequate information on danger signs during pregnancy, breastfeeding and replacement feeding; 2) pretest counselling and health talks were found by clients to be useful in determining how to discuss HIV/AIDS-related issues with their partner; 3) confidentiality was maintained, but privacy and shortage of staff in this service were seen as constraints; 4) infant feeding counselling (IFC) is the weakest service in the pMTCT package because of the lack of clear protocols of guidelines that providers can refer to. Since the government cannot sustain artificial milk as an infant feeding choice at this time, exclusive breastfeeding with early weaning after 4–6 months is the most affordable and accessible infant feeding choice for new mothers; 5) providers usually recommend replacement feeding or formula feeding to their clients, even though these choices are not financially sustainable. (There was frustration with not being able to offer artificial milk to clients who could not afford it and who could not safely breastfeed given low CD4 counts [less than 100].); 6) administrators and provid-

ers at two sites did not know how their clients were educated about infant feeding choices because counselling on this topic was done off-site; 7) women admitted being fearful of telling partner that they were HIV-positive. Few males are involved in the pMTCT program.

Observations of IFC in one of the three sites revealed that no provider gave client information leaflets on infant feeding options. Counsellors were inconsistent in the way they presented information on EBF, early cessation, advantages and disadvantages of infant formula and modified animal milk. Clients were not taught about optimal methods of breastfeeding, but those clients who opted for artificial feeding were informed about safety issues concerning formula preparation.

The focus group discussion on the topic of breastfeeding at another site reflected the dilemma of counsellors' discussing IF options that are not actually feasible for clients being counselled. Since replacement feeding is no longer provided at this site, only exclusive breastfeeding is promoted. All FGD participants, however, believed that the pMTCT program actually recommended replacement feeding over breastfeeding for babies of HIV-positive mothers, but the problem was the poverty of the population. One participant said that women were forced to switch to breastfeeding when the health centre stopped providing free artificial milk.

ANC session observations at the third site revealed that IFC was discussed in only 1 of 13 sessions. Providers reported that artificial milk was available in limited quantities and was reserved, at the discretion of the administration, for "exceptionally poor clients."

## Conclusions and recommendations of authors

Information and IF counselling: pMTCT counselling on IF needs to be strengthened. Providers need to be given information on how their clients will be counselled off-site and what the content of that counselling will be.

Care and support: Support for HIV-negative and HIV-positive clients needs to be strengthened; no pro forma follow-up care is provided to help HIV-negative women stay negative and HIV-positive clients find resources to help them take care of themselves and their babies.

Male involvement: Men need to be encouraged to participate in the pMTCT program and should be provided with information about pMTCT at VCT centres.

Client-provider relationships: Good relationships between clients and providers are key to the clients' success in following through with the pMTCT package, and program success depends on a high level of dedication of health care providers.

Under general lessons learned, site managers and the evaluation team noted that the pMTCT program would benefit by 1) developing a system for postnatal follow-up of clients and newborns; 2) adequately training providers and offering periodic upgrading training on pMTCT services; 3) developing strategies to increase and maintain staff motivation; 4) increasing community awareness of and participation in the pMTCT program; 5) increasing male involvement in the pMTCT program; 6) involving the community in pMTCT in order to follow up pMTCT clients, support HIV-positive mothers, and reduce stigma; and 7) integrating pMTCT services into mainstream ANC, maternity and nutritional service, and into the purview of health district management.

## Methodological considerations/ reviewer's comment

This rapid assessment appears to have been extremely well organized, generating a great deal of valuable information in a relatively short period of time using 6 structured instruments appropriate for the collection of relevant quantitative and qualitative data concerning pMTCT operational issues, health care providers and clients. The results are presented systematically, and organized by program site and key issues in a way that is useful to the reader.



## SOUTH AFRICA

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### Breastfeeding Promotion and IF Practices in South Africa (Bentley et al, 2002)

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#### Document title

Breastfeeding promotion and infant feeding practices in South African women living in an area of high HIV prevalence

#### Authors

Bentley J, Coutsooudis A, Kagoro H, Newell HL

#### Institution

University of Natal, South Africa; Medical Research Council, South Africa; University College, London

#### Date 2002

#### Country South Africa

#### Document type

Manuscript submitted for publication (not for distribution)

#### Source Authors

### Background

Results from a study of HIV transmission in Durban suggest that exclusively breastfed infants are less likely to become infected than those who are mixed fed. Exclusive breastfeeding (EBF) in the first 6 months has been shown to be beneficial in terms of health in both developing and developed countries. The 1998 DHS survey in South Africa showed an EBF rate of 10.4% in infants under four months. Bentley et al aimed to assess the EBF rate in an area of high HIV prevalence where free infant formula was being provided to HIV-positive mothers, in combination with an extensive breastfeeding promotion and support strategy.

### Methodology

Focus group discussions were held with lay counsellors and mothers to guide the development of the intervention. The intervention consisted of 12 lay counsellors, selected from the community and trained in breastfeeding counselling, promotion and support, who worked at the clinic and local delivery facility (tertiary hospital) and visited mothers in their homes. Posters and educational pamphlets were also distributed and four articles placed in the local newspaper. Baseline and evaluation (17 months later) questionnaires on infant feeding practices were administered to mothers attending the clinic in the intervention (n=214 baseline and 209 evaluation) and a control (n=217 and 209, respectively) area, with infants aged 0-26 weeks. The control site was a pMTCT pilot site where free formula was given during the last seven months of the intervention period.

### Results

Formula use within first 24 hours decreased significantly (30% to 0%) at the intervention site and increased significantly at the control site (4.8% to 15.4%), even though initiation of breastfeeding within the first hour was lower at the intervention site (due to tertiary hospital practices).

Most (over 80%) mothers breastfed during the previous 24 hours: the rate was similar at both sites, before and after the intervention.

The exclusive breastfeeding rate increased significantly from 13.9% to 21.5% in the intervention area but did not change significantly in the control area. Nearly 60%

of mothers introduced formula because they felt they had insufficient milk or were returning to work. The view that formula was good for babies increased at both sites, and there was a significant increase in the use of formula in the previous 24 hours at the control site (45.8% to 56.9%), where free formula was given during the last seven months of the intervention period.

Widespread use of over-the-counter medication (44.8%) and water (31%) was found. Water use was significantly reduced in the intervention area (32.7% to 20.6% of infants) and increased (30.1% to 40.7%) in the control area. In the intervention area, there was a significant reduction in the use of traditional medicines (10.3% to 3.3%), but no comment is made on commercial over-the-counter medicines (such as gripe water, etc.).

There was a significant reduction in the early (14-26 weeks) introduction of solids among infants at the intervention site (89.9% to 73.5%) and no change at the control site (about 85%).

An increase occurred in the number of mothers leaving expressed breast milk when separated. This activity rose from 5.8 to 25% (significant) in the intervention area and from 6.7 to 11.4% (not significant) in the control area. These increases may have been due to the distribution during the intervention period of a provincial government pamphlet about expressing breast milk.

EBF was significantly protective for diarrhoea compared with non-exclusive breastfeeding (4.8% versus 18.7% reported diarrhoea episodes in the previous two weeks).

Breastfeeding advice was received from various sources, including health staff, breastfeeding talks at clinic and home visits from breastfeeding counsellors. Some suggestion was made that health staff at the intervention site had shifted the responsibility of providing infant-feeding advice to breastfeeding counsellors, as more mothers at the control site had received such advice from health workers than at the intervention site.

## Conclusions and recommendations of authors

It is possible to improve exclusive breastfeeding rates at a population level, even in an informal (and likely transient) community.

Exposure to conflicting advice and information (perceived health worker endorsement of formula through free provision as part of pMTCT programme, media coverage of MTCT risk through breastfeeding, little support for EBF in tertiary hospital and then promotion by breastfeeding counsellors) highlights the need for comprehensive, coordinated and specific messages regarding exclusive breastfeeding.

## Methodological considerations/ reviewer's comment

This was a small but carefully implemented study, conducted at baseline and follow-up in both the intervention and control clinic areas.

Weakness. Only mothers attending clinic were interviewed.

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## Khayelitsha, South Africa MTCT Programme (Chopra et al, 2000)

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### Document title

Summary of the findings and recommendations from a formative research study from the Khayelitsha MTCT Programme, South Africa

### Authors

Chopra M, Shaay N, Sanders D, Sengwana J, Puoane T, Piwoz E, Dunnett L

### Institution

University of the Western Cape Public Health Programme; USAID (SARA Project); DoH Provincial Authority of Western Cape

**Date** May 2000

**Country** South Africa

**Document type** Research report

**Source** Author

## Background

In 1998 the Provincial Authority of the Western Cape decided to provide a free short course of antenatal and intrapartum AZT to HIV-positive women in Khayelitsha, an urban township near Cape Town with a seroprevalence of 15%. Women were told not to breastfeed and were given a prescription for free formula, which could be obtained at local clinics. This report presents the findings of a formative research study of infant feeding practices and the influence of the pMTCT programme on infant feeding in the Khayelitsha area.

## Methodology

This study involved structured interviews with 70 caregivers randomly selected from clinics; semi-structured interviews with 11

HIV-positive mothers (seven part of pMTCT programme, remainder did not receive AZT but were receiving free formula) and 11 health workers (mainly the nutrition counsellors for the pMTCT programme); and household interviews and Trial of Improved Practices (TIPS) in 17 homes. The household interviews systematically overrepresented better-off households.

## Results

*From interviews with caregivers (unknown HIV status; n = 70):*

Caregivers had poor knowledge about MTCT risk: 40% stated that transmission occurred primarily during pregnancy, 27% mentioned breastfeeding as a mode of transmission, while only 7% mentioned delivery. When probed, 62% affirmed that they had heard of transmission through breastfeeding: 30% believed all HIV-positive mothers who breastfeed transmit the virus to their infant, and 45% said they didn't know what percentage of HIV-positive mothers would transmit the virus if they breastfed.

Caretakers believed knowledge of MTCT risk would have little impact: 90% of respondents said they would not change their infant feeding practice as a result of knowing the risk of transmission via breastfeeding, but 68% stated that an HIV-positive woman should not breastfeed her baby.

Many (80%) knew a woman who did not breastfeed: One-third thought this was because she was HIV-positive. Family, community and health worker reactions to women who did not breastfeed were reported to be very negative, as they will assume infidelity, a desire to become pregnant again or negligence of the baby.

Numerous advantages of breastfeeding were reported by "nearly all" caregivers, including protection against disease and bonding, with an optimum duration of two years. Only one woman reported that breastfeeding protected against HIV.

So-called "exclusive breastfeeding"<sup>18</sup> was practised for a very short time, with half of caregivers reporting the introduction of formula (mostly Nan or Pelargon) before one month and most before three months. Such EBF was practised by default by those unable to afford other milks or if baby rejects the bottle.

Early introduction of commercial complementary feeds occurs before four months, on advice of health workers, or purchase by family members. Cues for introduction of solid food include crying after breast or bottle feed, reaching for food and teething.

*From interviews with HIV-positive mothers (n = 11):*

None reported discrimination for not breastfeeding: These mothers told people a variety of explanations: have TB, breast sores, "have poison in breasts", told not to breastfeed by health worker.

All said they were advised (during pre-test counselling) not to breastfeed if they were found to be HIV-positive: "Most" found it difficult not to breastfeed, but all reported that they had never done so due to the risk of transmission. When told of the study reporting reduced risk of MTCT with exclusive breastfeeding, ten HIV-positive mothers did not believe the results, and all 11 said they would not breastfeed exclusively in the future. No mother reported being informed about the risks of not breastfeeding.

Infant-feeding counselling was poor: No mother reported discussion of options or risk of each choice, and mothers were only told about infant feeding during pre-test counselling. Limited information had been given on how to correctly formula feed. They reported receiving one kg of formula per month, which would be supplemented with sugar water or juice between milk feeds (only given three-to-four times a day to conserve milk). Solids were introduced by four months of age.

*From interviews with health workers (n = 11):*

Poor counselling: Health workers (HWs) had limited knowledge of optimal infant feeding and were unclear about MTCT risks; they were increasingly confused as a result of the pMTCT programme.

All reported telling HIV-infected mothers not to breastfeed, and no HW accepted expressing and heat-treating breast milk. None had seen national or provincial guidelines for MTCT.

HWs gave mixed responses to a study reporting reduced risk of MTCT with EBF. Four said they did not believe the results and would not change their advice; seven said they would.

*From household observations and TIPS (n = 17):*

Households had basic sanitation and food: "Nearly all" had on-site soap, water, sanitary facilities, formula tins, and bottles that appeared clean, some graduated for volume. Most had vegetables, fruits, commercial cereals, and facilities for storing formula. Ten had a refrigerator or cooling cupboard.

Formula preparation inadequate: Although water was boiled (not for more than 1 minute) and scoop used, the number of scoops varied enormously (one-to-seven). Caregivers reported not saving unfinished feeds, although household income suggests that formula cannot be easily afforded and "most" reported running out of formula during the month.

Cup feeding during the day was readily taken up, but no mothers of infant under four months were willing to try EBF. Some mothers (one third) succeeded in expressing milk, but the idea of boiling breast milk was alien and dismissed.

Maize meal porridge was widely fed to young babies, but rarely enriched, despite on-site availability of oil, margarine, peanut butter and eggs.

True EBF was rare and formula feeding is becoming the norm, among all mothers. Health workers often recommend early supplementation with formula and/or solids. Commercial weaning foods and un-enriched porridge are introduced very early, but mothers are willing to accept and adopt enriched porridge and cup feeding.

## Conclusions and recommendations of authors

Strengths of pMTCT programme: Mothers in the programme have benefited from facing up to their diagnoses. Support groups facilitated this progress. Programme tools for formative research are very useful.

Weaknesses of pMTCT programme: The quality of counselling provided by health workers is generally poor. The pMTCT programme has further confused them about appropriate messages.

Stigma related to HIV/AIDS: Despite high public awareness of HIV/AIDS, it elicits fear and stigmatisation in the community. In contrast, many HIV-positive mothers said they coped well with public disclosure.

HIV and breastfeeding: Widespread misunderstanding among health workers and caretakers about the risk of spreading HIV via breastfeeding. As a result, health workers advise all HIV-positive mothers to formula feed regardless of risk, resulting in no informed choice. All HIV-positive mothers interviewed were formula feeding exclusively and struggling financially; some gave insufficient or over-diluted formula. Some might have chosen to breastfeed had they been given all information. There is an urgent need to train health workers to appropriately inform mothers.

Infant Caring Practices: Feeding practices should be monitored to inform on-going advice and support for mothers, and HIV-negative mothers should be assessed to determine whether they/their children are being adversely affected.

**Methodological considerations/  
reviewer’s comment**

This was a large and carefully conducted study, but there was systematic overrepresentation of better-off households in the household observations.

**South Africa National pMTCT  
Pilot Sites (McCoy et al, 2002)**

**Document title**  
Interim findings on the National PMTCT pilot sites: Lessons and recommendations

**Authors**  
McCoy D, Besser M, Visser R, Doherty T

**Institution**  
Health Systems Trust, for National Department of Health, South Africa

**Date** February 2002

**Country** South Africa

**Document type** Published report

**Source** Author

**Background**

At the end of 2000, the South African government decided to implement a pilot programme for pMTCT at two sites in each of the nine provinces. This programme provided women who requested appointments for antenatal care with VCT and counselling on infant feeding. Women identified as being HIV-positive are given NVP, to be

taken during labour, NVP for their babies, as well as free formula for six months. This report presents data from an evaluation of the pilot sites carried out at the end of 2001.

**Methodology**

Data collection included key informant interviews, site visits and document reviews of routinely collected and programme-specific registers. Data on infant feeding (IF) reflects reported practices and reported IF intentions, as stated by the mothers soon after delivery. (Researchers recognize that mothers may report what they believe the nurse/counsellor collecting the information wishes to hear.) There was no data on transmission, since the pilot programme had not been implemented for a long enough period of time.

**Results**

Most women choose to replacement feed (RF) using infant formula, although there is considerable variation across sites. Breastfeeding was more prevalent in rural areas and in Durban.

**Programme description**

<b>Number of sites</b>	193 health facilities (21 hospitals, 12 MOU/CHC/day hospitals and poly clinics, 160 clinics)
<b>Coverage</b>	Approximately 6090 antenatal appointments per month (about 9% of national antenatal appointments per month)
<b>Uptake</b>	Only about 51% of women agree to test for HIV, with wide range of uptake figures across sites.
<b>Seroprevalence</b>	Ranges from 8.7% to 36.2% across provinces
<b>ARV intervention</b>	NVP was provided to mother at 28 weeks with instructions to take it at onset of labour. Baby is given NVP 24-72 hours post-delivery, unless mother took a dose less than two hours before delivery, in which case baby is given an additional dose immediately after birth.
<b>IF counselling</b>	An assessment is made of mother's ability to provide safe formula feeding; she is then advised on which feeding option may be most appropriate.
<b>Breastfeeding</b>	Women choosing to breastfeed were advised to do so exclusively. No information was given on recommended duration of exclusive breastfeeding (EBF).

Rural Mpumalanga: It was difficult to get data on breastfeeding, as mothers do not attend hospital for follow-up.

Rural KZN: Hospital does not encourage formula feeding, as counsellors “do not consider mothers educated enough to correctly mix feeds” and community associated formula feeding with being HIV-positive. Retraining of health care workers was recommended to prevent coercion.

Spillover of formula feeding was suspected, but no data on this was collected. Infant formula may also be shared with other children.

Province	Rural/Urban	RF	EBF
Gauteng	Urban/Peri-urban	96%	3%
	Rural/Peri-urban	85%	15%
W Cape	Urban/Peri-urban	95%	4%
	Rural/Peri-urban	73%	27%
N Province	Urban/Peri-urban	73%	7%
	Rural	N/A	N/A
Mpumalanga	Urban	89%	11%
	Rural	74%	26%
Free State	Urban	77%	23%
	Rural	68%	32%
KwaZulu-Natal	Urban	40%	42%
	Rural	65%	35%
E Cape	Urban	69%	31%
	Rural	54%	46%
N Cape	Urban	82%	8%
	Rural	100%	0%
North West	Urban	81%	19%
	Rural	79%	0%

## Conclusions and recommendations of authors

- The authors recommend employing and equitably remunerating more lay counsellors (but the reviewer found no link between this recommendation and the results).
- Complement VCT training with training on infant feeding and child health.
- Reconsider providing free infant formula, as current policy may contribute to increased mortality and morbidity, and may encourage mixed feeding. Free infant formula may entice mothers who could not safely replacement feed to opt for this IF method.
- A national commission of experts should consider possible options: recommend using infant formula only to those who could afford to safely replacement feed; develop support and strategy to enable women to exclusively breastfeed; target free infant formula only to communities/households that could safely replacement feed; and provide ARV to mother and infant for duration of breastfeeding.
- If free infant formula is provided, continued access must be ensured.

On-going research in South Africa includes:

- Study of change in IF practices in 1800 mothers attending immunisation clinics
- Qualitative research into IFP in N. Province, North West and KZN (by HSRC) to describe determinants
- Cohort of mothers at three pilot sites (W. Cape, E. Cape, KZN) investigating IF practices and transmission over first nine months of life.

## Methodological considerations/ reviewer’s comment

This is an interim report, detailing the progress made by provinces in the implementation of the pMTCT pilot programme. Relatively little information is given on infant feeding practices.

Weakness: Data relate to IF practices collected by nurse/counsellor soon after delivery and reflect intention (and also bias related to the mother having to report to those who counselled them), rather than actual practice after discharge from hospital.



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## Counselling Options for HIV-Infected Women in Rural SA (Rollins et al, 2002)

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### Document title

Counselling HIV-infected women on infant feeding choices in rural South Africa

### Authors

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### Institution

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**Date** October 2002

**Country** South Africa

**Document type** Draft manuscript

**Source** Author

### Background

UNAIDS guidelines promote the informed free choice by mothers with respect to infant feeding (IF), but also recommend that mothers be given "specific guidance in selecting the option most likely to be suitable for her situation". Understanding feeding choices is complicated and making modifications to the WHO/UNICEF HIV and Infant Feeding Counselling (HIFC) Course seemed necessary. At the time of this study, free infant formula was not available at clinics in the area.

### Methodology

Pregnant women attending antenatal clinics (n=189) were counselled using the

modified HIFC Course, and the appropriateness of their choice and actual feeding practice during the first week of life were compared. An ethnographic study was also conducted to describe the perceptions of the trained counsellors with respect to their training and the task of counselling using the modified approach.

### Results

HIFC presents the advantages and disadvantages of five or six options, and counsellors found women were overwhelmed and still asked for explicit advice on how to feed their child.

Counselling was modified to first consider woman's feeding intention and then consider appropriateness of the intended feeding practise based on circumstances, using a visual tool where appropriate. The counselling session first starts with a discussion of infant feeding over the first 12 months of life and recommends that mothers either exclusively breastfeed (according to WHO definitions) or exclusively replacement feed for the first four-to-six months. The mother is then asked what her intention is in light of her HIV status, and this intention is explored in terms of previous experience, whether feedings would be mixed or exclusive, plans to return to work, etc.

Stating aim of a healthy child by two years of age (HIV free and avoiding serious illness such as pneumonia or diarrhoea), this method highlights the need for exclusivity and the counsellor then explores the feasibility of the intention using a simple chart to focus discussion on home, personal circumstances (including prospect of disclosure and support) and family expectations.

If the intention seems appropriate, the counsellor affirms it and also gives information that there are other options (e.g., heat-treating breast milk, alternative replacement feeds) that women may choose. If circumstances do not favour the intended feeding method or a better practice could be feasible, the counsellor discusses other options in detail. Counselling takes place over a number of sessions.

If the mother is unsure about how she intends to feed, the counsellor starts by giving information on various options and relative risks of transmission, before exploring mother's home and personal circumstances.

Out of 189, 171 (91%) of women intended to exclusively breastfeed (EBF), while only 18 (9%) intended to replacement feed (RF: 17 formula, one modified cow's milk). There was no correlation between intention and socio-economic variables, but if the mother was the main income provider, this was significantly associated with the intention to give commercial formula.

Most women did not have the four necessary conditions for safe RF (access to clean water, refrigerator, fuel for boiling water, regular source of income), but of the 28 (15%) women who did meet these conditions, only three planned to RF. The others chose to breastfeed due to concerns with stigma and practicalities of avoiding breastfeeding altogether. If a regular source of income were removed from conditions, another 11 women would have all three remaining conditions available: none of them would have chosen exclusive RF.

Fifteen women planned to replacement feed (RF) even though they had less than

ideal conditions for safe RF: 10 in 15 had two or fewer conditions for safe RF. Anecdotal evidence suggest that the plan to RF was due to fear of transmitting HIV and the desire to completely avoid breastfeeding.

Intended RF was not necessarily initiated: 12 out of 18 mothers initiated and continued breastfeeding during the first week; 100% of mothers intending to breastfed initiated and continued EBF during the first week. Anecdotal evidence suggests this was due to "baby friendly" environment in hospital, mother's reluctance to disclose status, and family expectation to breastfeed.

Mothers seemed satisfied with counselling approach and counsellors believed their job involved helping women to make informed choices and that the training was relevant.

## Conclusions and recommendations of authors

Criteria previously considered to be determinants of feeding choice were not necessarily the basis for intended practice.

Availability of safe RF conditions were limited in rural KwaZulu-Natal, but most

women who did have all four conditions available still chose to EBF (due to family expectations, stigma, concerns about disclosure and beliefs regarding benefits of breastfeeding).

A regular source of income is a major factor in deciding to RF, but even if no regular income is available in household, most mothers still chose to EBF, suggesting that a steady income is not a major influence on the decision.

Most mothers who intended to RF initiated and continued EBF in first week, suggesting that external pressures and community perceptions are very important.

Modified counselling approach seems to be effective and focuses on woman's viewpoint and insight into the feasibility of feeding options.

## Methodological considerations/ reviewer's comment

There was a potential bias in that women who were very dissatisfied with the counselling they received may not return to or be available or willing to participate at follow-up.

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## Experiences of Breastfeeding and Vulnerability (Seidel et al, 2000)

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### Document title

Experiences of breastfeeding and vulnerability among a group of HIV positive women – discussions with a peer support group of HIV positive mothers at King Edward Hospital, Durban, KwaZulu-Natal, South Africa

**Authors** Seidel G, Sewpaul V, Dano B

### Institution

Sante et Developement, Universite de Bordeaux, France; Department of Social Work, University of Natal, Durban, South Africa

**Date** 2000

**Country** South Africa

### Document type

Journal article: *Health Policy and Planning* 2000, 15(1):24-33

**Source** SAFAIDS

## Background

There have been few studies that elicit HIV-positive mothers' experiences in breastfeeding and paediatric infection. There is an urgent need to document this knowledge and use the data to inform policy development and for advocacy and counselling purposes.

## Methodology

Two in-depth discussions were held with a group of 13 HIV-positive mothers, using facilitators well known to the mothers. Discussions included further dialog to clarify ambiguous terms in Zulu and clarify meanings.

## Results

Seven out of 13 HIV-positive mothers had not breastfed because they had been "told" not to breastfeed (although not initially); one had read about HIV transmission and decided against breastfeeding, one had overheard a nurse talking and acted on this information, and four had chosen not to breastfeed because they were working or seeking work.

Only two of the 13 knew they were HIV-positive during pregnancy, but all claimed not to have been told anything about HIV transmission through breastfeeding, either during their pregnancy or immediately after. Those who had been advised to stop breastfeeding had been told to do so only once their infant became sick. They expressed considerable regret and anger that this information had not been made available to them.

The association between breastfeeding and bouts of diarrhoea in their children caused a number of participants to stop breastfeeding of their own account.

Many mothers reported stopping breastfeeding once their child was admitted and found to be HIV-positive: There was no mention in the report of the potential advantages of continued breastfeeding for infected children. When one participant asked the others about the link between breastfeeding and diarrhoea, there was consensus that stopping breastfeeding did not stop the diarrhoea. Even the child of the mother who chose not to breastfeed from birth suffered prolonged diarrhoea.

Breastfeeding was seen as the norm and some women suffered verbal and physical

abuse for not breastfeeding. One mother reported that not breastfeeding had given her increased freedoms, but others felt that it broke the bond between mother and baby.

Women were not financially able to purchase infant formula and there seemed to be some confusion as to the formula milk prescribed for their child while in hospital. No formula is prescribed for use after discharge, unless a child is on special feeds, but this distinction did not seem to have been clearly explained to the group.

Women who do not breastfeed are blamed and abused by male family members.

Women were "told" what to do in terms of infant feeding and not helped in decision-making.

## Conclusions and recommendations of authors

The authors concluded that: 1) There is a lack of information given to HIV-positive mothers and pregnant women in general about the risks of breastfeeding. 2) There are different understandings of formula milk (including special lactose-free milks). 3) Although confirmatory data are lacking as to whether nurses counselling women in infant feeding and the importance of breastfeeding knew the women's status, the study highlights a form of denial of HIV and its transmission of HIV by nurses trained to support breastfeeding. 4) Women's knowledge and experience gained by the observation of a relationship between breastfeeding and diarrhoea were apparently disregarded, thus humiliating mothers.

## Methodological considerations/ reviewer's comment

The methodological weaknesses in this study include:

- Use of group facilitators to conduct discussions, may have lead to bias, depending on the skill of the facilitator and previous group dynamics.
- There was no discussion of how knowledge of HIV status during pregnancy influenced decision making. All mothers were "lumped" together and there is considerable bias in the reporting of results, such that they are occasionally contradictory and often initially represent only one side of the data collected.
- Mothers' opinions were retrospective and given in the light of their subsequent discovery of their HIV status. Their responses and recollection of information regarding HIV and infant feeding may be biased by length of recall and nature of the questioning.

Although this paper highlights issues of inequality and hierarchy within the health provider-client relationship that contribute to inadequate support for infant feeding decision-making, some inconsistencies and misrepresentations of the data make it difficult to draw conclusions. The women's experiences and feelings about infant feeding, after they had discovered both their child's and their own HIV status could have been explored in greater depth. It was not clear at what age the data on feeding practices presented was reported, and this caused confusion, as feeding practices had changed after diagnosis. Women's discussions of infant feeding were quoted as if all had known their status during pregnancy and had been denied information deliberately.

# SWAZILAND

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## Rapid Situational Analysis of BFHI in Swaziland (Vilakati and Shongwe, 2001)

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### Document title

Rapid situational analysis of the BFHI in Swaziland

**Authors** Vilakati D, Shongwe N

### Institution

BFHI Taskforce, Swaziland Infant Nutrition Action Network (SINAN); National Nutrition Council

**Date** May 2001

**Country** Swaziland

### Document type

Report of a "Rapid Assessment"

**Source** UNICEF ESARO CD

## Background

The National Baby Friendly Hospital Initiative (BFHI) Taskforce was established in 1992 and was challenged by aggressive marketing of breast milk substitutes and the emergence of HIV/AIDS. This study aimed to 1) establish the BFHI status in health facilities, 2) establish the impact of MTCT on breastfeeding practices, and 3) identify information gaps among health care providers.

## Methodology

Checklist-guided interviews were conducted with health workers (doctors, nurses, counsellors) in six referral hospitals and five health centres.

## Results

1) Promotion of breastfeeding still occurred, in principle, in all centres; 2) breastfeeding policy was usually not displayed or known of; 3) availability of VCT was very irregular; 4) majority of health workers discouraged breastfeeding by HIV-positive mothers, but opinions disparate; 5) most health workers did not know of the 'Code' or what it entails; and 6) very little training had been provided in infant feeding counselling.

Observations (no data was given in support): 1) Commercial infant formula and feeding bottles (with teats) were seen in duty rooms and wards; 2) there were few breastfeeding counsellors; 3) communities were still in denial, and people who were tested (VCT) usually did not return for results; those who did return are discouraged by delayed return of results; testing was mostly carried out in the central hospital (lab capacity of peripheral units was inadequate); 4) the promotion and support for

BFHI has slowed down; and 5) formula feeding has "brought back malnutrition".

## Conclusions and recommendations of authors

Authors concluded that Swaziland should: 1) Re-launch the BFHI; 2) train more breastfeeding counsellors, and incorporate HIV/AIDS into the training; 3) effectively legislate and disseminate the 'Code of Marketing of Breast-milk Substitutes' to health workers; 4) develop policy and guidelines on HIV and IF; 5) establish a nutrition rehabilitation centre; 6) consider providing locally available and acceptable replacement foods; and 7) develop counselling materials and the educational capacity of the public and health workers on MTCT and IF.

## Methodological considerations/ reviewer's comment

This obviously rapid and cursory survey does not provide substantiated data but does demonstrate confusion among health workers, significant problems with application of the "Code", and a need for increased capacity and effectiveness of VCT and infant feeding counselling.

# TANZANIA

## Counsellors' Perspectives in N. Tanzania (de Paoli et al, 2002)

### Document title

Counsellors perspectives on antenatal HIV testing and infant feeding dilemmas facing women with HIV in northern Tanzania

### Authors

de Paoli M, Manongi R, Klepp K-I

### Institution

Institute of Nutrition Research, University of Oslo, Norway; Community Health Dept, Kilimanjaro Christian Medical College, Tanzania

### Date

2002

### Country

Tanzania

### Source

Author

### Document type

Article in press (*Reproductive Health Matters*, 2002)

## Background

Studies in resource-poor settings have identified constraints and barriers—in terms of infant feeding choices—for pregnant women who are offered VCT antenatally. It has been suggested that many weaknesses exist in the counselling currently provided by pMTCT programmes and that these must be significantly strengthened.

## Methodology

In-depth interviews were held with all 16 HIV/AIDS counsellors for a pMTCT trial in Moshi, five local HIV/AIDS counsellors and two medical doctors who had been working in VCT for many years.

## Results

Counselling appeared to have a coercive element, and counsellors themselves reported that their role included convincing pregnant women to take the HIV test and regarded it a failure if they were could not do this.

Most counsellors believed that a women choosing not to breastfeed risked stigmatisation of being identified as HIV-positive and that this contributed to women's decision to breastfeed. The financial burden of replacement feeding (free formula was not supplied) was also a barrier, especially when the woman did not disclose status to husband, who controlled the money.

Replacement feeding was seen as an option only for educated women with economic means, who were the minority. They were also assumed to have all the necessary knowledge and skills to safely carry out their infant feeding choice.

Counsellors realised that an infant feeding choice was difficult to implement in rural areas and that EBF would be the best option for HIV-positive mothers, although most would only partially breastfeed, in part because of the common belief that infants need additional water. However, knowing her HIV status may motivate some mothers to practise EBF.

None of the counsellors had breastfed exclusively themselves, questioned the safety of EBF and thought it would not be viable. If HIV-positive themselves, they would chose replacement feeding

Counsellors expressed disbelief in the effectiveness of heat-treating breast milk to destroy HIV and counsellors felt it would be very difficult to explain this to mothers (as they themselves were not convinced and found it difficult concept to understand).

Some counsellors (and educators) were unclear about the meaning of EBF and did not believe it was possible.

Incorrect advice was given about abrupt cessation of breastfeeding, counsellors lacked knowledge of how to advise mothers to feed an infant after cessation, and advice on modifying cow's milk was confused and incorrect.

Counsellors knowledge of MTCT risk was inadequate, and risk of transmission through breastfeeding was regarded as much greater than risk of diarrhoea or malnutrition if not breastfed.

Counsellors emphasised that counselling was time-consuming and should include follow-up, but no facilities were available for this. Lack of follow-up contributed to their feeling of lack of control and was viewed as major weakness of the trial.

## Conclusions and recommendations of authors

- The IF choice was seriously compromised by the advice given, directive counselling and lack of time to cope with results and follow-up support.
- IF options were not always clearly explained, and counsellors believed women had little choice but to breastfeed and were unlikely to EBF.



- Risks and benefits of feeding options were too complicated for counsellors to understand.
- Further training in feeding options, counselling skills and cessation is needed.
- Follow up is needed with mother to enable counsellors to see to impact of their advice.

### Methodological considerations/ reviewer's comment

- All counsellors were included and are believed to be representative.
- Responses were perceived by interviewer to be honest and credible, showing no signs of wanting to impress.

This study shows clearly how counsellors' personal experience, lack of knowledge and skills and bias in favour of one feeding option influence (and undermine) their ability to provide adequate counselling that is non-directive and supportive to HIV-positive women. In addition, health worker knowledge and attitudes regarding the feasibility of EBF was a major barrier to the promotion of this feeding option.

## Exclusive Breastfeeding in Era of AIDS (de Paoli et al, 2001)

### Document title

Exclusive breastfeeding in the era of AIDS

### Authors

de Paoli M, Manongi R, Helsing E, Klepp K-I

### Institution

Institute of Nutrition Research, University of Oslo, Norway; Community Health Dept, Kilimanjaro Christian Medical College, Tanzania

**Date** July 2001

**Country** Tanzania

### Document type

Journal article (*J Hum Lact* 2001, 17 (4); 313-320)

### Background

Breastfeeding is widely practiced in Tanzania, where rates of initiation are high and prolonged duration (22 months) occurs. However, median duration of EBF is only one month. Knowing more about the factors that discourage or encourage EBF would help to assess its feasibility and identify effective interventions to increase EBF rates.

### Methodology

This study aimed to describe breastfeeding practices and what pregnant women know about MTCT, as well as explore socio-demographic factors that are associated with current breastfeeding practices. Five hundred pregnant women (regardless of HIV status) were enrolled at four urban and five rural clinics in the Kilimanjaro area. Feed-

ing histories were obtained from the 309 who had previous breastfeeding experience; a structured questionnaire was administered to them during a cross-sectional interview by trained nurses from the referral hospital. Six focus group discussions (FGDs) were conducted with 46 pregnant women attending the same clinics; about half had participated in the interview survey. A FGD was also held with 10 active female members of the Kilimanjaro Women's Group against AIDS; information from the FGDs was used to validate the data from the interviews.

### Results

High rates of initiation of breastfeeding were found, with 85% initiating breastfeeding within the first few hours of birth and 91% reporting using colostrums. Reported duration averaged 23.7 months and did not vary by socio-demographic factors. Mothers intended to breastfeed their currently expected child for 32.3 months on average; shorter intended duration was associated with factors including younger maternal age, lowest parity, unmarried status and urban residence.

The study found that 18% of newborns were given prelacteal feeds (usually water or sugar water) and the remaining 82% were given breast milk as first feed.

Exclusivity of breastfeeding was broken within the first few days by 46% with the introduction of water, sugar water or cow's milk because child was believed to be thirsty, as breast milk did not quench thirst. Complementary foods were introduced on average by 3.4 months of age.

Poor knowledge of MTCT risk was found, with only 37% correctly identifying possible routes of transmission. FGDs revealed strong, widespread belief that all infants born to infected mothers are already infected in utero.

Breastfeeding was highly valued, but only 17% of women (mostly urban) knew that it was not necessary to offer infants additional fluids in the first four months of life.

Associations with longer EBF: Being married and knowing that additional fluids are not needed before 4 months were the only factors associated with longer EBF.

### Conclusions and recommendations of authors

- Some findings are consistent with other studies in Tanzania: that while partial breastfeeding endures for long periods, EBF is rare and other fluids are often given from a very early age.
- Young, unmarried, non-farming urban women reported shortest intended duration of breastfeeding, possibly due to perception that breastfeeding leads to less attractive breasts.
- Attendance at urban clinic was associated with greater knowledge of EBF, indicating that health worker knowledge, skills and motivation are influential.
- Knowledge of EBF was a strong predictor for not terminating EBF within the first few days.

- Information about EBF and risk of MTCT were received with skepticism, particularly due to strong belief that infants are already born infected.

- Early introduction of fluids needs to be challenged.

### Methodological considerations/ reviewer's comment

Retrospective data on breastfeeding practices is subject to recall bias and digit preference. The study had high participation, but mothers were selected by clinic staff and not randomly

This research collected data that correspond with other known and documented findings; the vast majority of African women initiate and continue breastfeeding into the 2nd year of life. The study also tried to elucidate when EBF stopped and the factors that may predict this. However, the sampling method chosen (women pregnant again) introduced further recall bias and could have been reduced somewhat by selecting new mothers instead, in order to focus on early feeding practices and factors associated with EBF failure. Women's knowledge of EBF seemed to be an important factor in maintenance of EBF, although no details are provided as to the duration of this. Poor knowledge of MTCT risk factors was widespread, and in one FDG was shown to be an important barrier to acceptance of EBF as a means to reduce MTCT risk.

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## Breastfeeding Promotion Dilemma in Tanzania (de Paoli et al, 2000)

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### Document title

Breastfeeding promotion and the dilemma posed by AIDS in Tanzania

### Authors

de Paoli M, Manongi R, Klepp K-I

### Institution

Institute for Nutrition Research, Oslo, Norway; Kilimanjaro Christian Medical College, Moshi, Tanzania

### Date 2000

### Country Tanzania

### Document type

Report in *MCH News* 2000 (15)

### Source UNICEF ESARO CD

### Background

Transmission of HIV through breast milk has complicated the advice on infant feeding (IF) in resource-poor settings. This study evaluated pregnant women's perceived feasibility of the Revised Guidelines on Breastfeeding and HIV from June to September 1999.

### Methodology

This was a structured cross-sectional interview survey of systematically selected pregnant women (n=500) attending one of nine selected antenatal clinics in urban and rural settings. Focus group discussions (FGDs) were also held.

## Results

All respondents had a strong intention to breastfeed, and those with previous experience recalled a median duration of 2 years.

These women largely believed that all infants of HIV-positive mothers were infected in utero, although a majority knew the virus could be transmitted during pregnancy, birth and breastfeeding. Awareness of MTCT was high and did not vary by demographic factors.

One-third strongly believed pregnant women should be offered VCT; depending on motivation, 29% said they would strongly agree to VCT to help them make IF decisions; and 39% would want to be able to receive medication to reduce the risk of MTCT.

Only 7% had been tested themselves and 39% noted the importance of testing fathers, too; however, half believed HIV status should be kept a secret in the family, for fear of social ostracism. Many had witnessed ostracisms of people living with HIV/AIDS (PLWHA).

Seventy-one percent (71%) would lie about their HIV status if they chose not to breastfeed, and two-thirds would not publicly show they were replacement feeding. They clearly believed breastfeeding was superior and the preferred IF method.

Cow's milk was regarded as the most feasible IF alternative for HIV-positive mothers (other feeding methods, formula and expressed heated-treated milk received low scores). Thirty-seven percent strongly believed that advice to HIV-positive mothers not to breastfeed would cause them worries. The major obstacle to replacement feeding was financial resources for obtaining and preparing it. However, if offered free or subsidised, it achieved highest scores as a choice for HIV-positive mothers.

The idea that EBF might be "protective" (this was how concept was incorporated into FGD) was not easily understood, seen as contradictory and received with scepticism.

## Conclusions and recommendations of authors

The authors concluded the following: Not to breastfeed was seen as a complicated choice, and mothers would likely be labelled as HIV infected and face a high risk of stigmatisation. Efforts to involve husbands should be considered as a way to reduce this. There are still many dilemmas to investigate and MTCT efforts will face educational challenges related to misconceptions, stigma and how to advise mothers on infant feeding.

## Methodological considerations/ reviewer's comment

This was a carefully conducted study, with strict random selection criteria.

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## Rapid Assessment of pMTCT in Tanzania (Swartzendruber et al, 2002)

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### Document

Evaluation of the UNICEF-Sponsored Prevention of Mother-to-Child HIV Transmission (pMTCT) Pilot Sites in Tanzania

### Authors

Swartzendruber A, Msamanga G, PMTCT Evaluation Team

### Institution

Centers for Disease Control and Prevention; Tanzania Ministry of Health; Institute of Public Health, Muhimbili University College of Health Sciences

**Date** December 2002

**Country** Tanzania

**Document type** Programme Report

**Source** USAID/Tanzania

## Background

The population of Tanzania is currently estimated at 34.5 million, with a population growth of 2.9% per annum. Approximately 2.2 million people aged 15 years and above are HIV-positive. Among blood donors, the overall prevalence of HIV infection in 2001 was 11.01%. Estimated median HIV prevalence among women attending ANC clinics in 2002 was 9.6%, ranging from 5.6% in Kagera to 16.0% in Mbeya. While 95.6% of pregnant women in Tanzania register for ANC, less than half (43.5%) of women deliver in health facilities (34.5% in rural areas and 82.8% in urban areas). Assuming 1.5 million annual live births, 12% HIV prevalence among pregnant women, and 40% risk of HIV transmission from mother to child with no pMTCT services and one-to-two years breastfeeding, an estimated

180,000 infants in Tanzania are exposed to the risk of HIV infections each year, with 72,000 becoming infected. In 1999, the under-five mortality rate was estimated to be 147 per 1,000 live births, and the infant mortality rate was estimated to be 99 per 1,000 live births. Despite high HIV seroprevalence rates, the total fertility rate is 5.6 births per woman and only 15.6% of all women aged 15–49 years currently use any method of modern contraceptive.

With support from UNICEF, planning for the pMTCT pilot project in Tanzania began in 1998, and implementation of services began in at five sites in 2000, four referral hospitals (two of which each supported health center activities) and one regional hospital. The pilot project included: VCT for new ANC attendees using rapid testing; short-course AZT to HIV-positive pregnant women (starting at 36 weeks); infant feeding counseling; modified obstetric care; and monitoring and follow-up, including HIV testing of exposed children at 15 and 18 months of age. In 2002, the Tanzania Ministry of Health (MOH) requested the US Centers for Disease Control and Prevention/Global AIDS Program (CDC/GAP) and Tanzanian counterparts to conduct an evaluation of the 5 UNICEF-sponsored national pMTCT pilot sites to inform planning of integrated national pMTCT services in Tanzania. Specifically, the terms of reference called for review of pMTCT service provision and utilization at the pilot sites, site management, coordination and logistics, and impact of the pilot project.

## Methodology

The main objectives of this rapid assessment, conducted December 2–10, 2002, were to provide an overview of the pilot program; summarize key pMTCT activities,

achievements and challenges; and to describe the progress and impact to date, as well as the potential for expansion of pMTCT services to other regions and health facilities.

The evaluation of the five pMTCT program sites included: discussions with MOH and collaborating partners to understand the roles of stakeholders, as well as goals, activities and future directions; discussions with site coordinators and local pMTCT Task Forces to identify key activities as well as capacity, strengths and challenges; discussions with site implementers to understand daily implementation of pMTCT services, staff needs and perspectives; site visits to observe and understand daily implementation procedures and set up; and document reviews to supplement information gathered by other methods (the original proposal, existing written site descriptions, monitoring forms, reports [progress, meetings and final donor report to UNFIP], clinical guidelines and training material).

## Results

This evaluation generated a large amount of relevant pMTCT program information. The following findings are of particular interest to the discussion of HIV and infant feeding.

Coverage and program performance: The three regional and district health facilities implementing pMTCT as part of the pilot project reported more new ANC clinic attendees than all four of the referral hospitals. The vast majority of women delivering at the pilot sites were of unknown HIV-status (up to 99%). Across all sites, the evaluation team noted large differences in counselling rates (9–56%), high acceptance and good use of HIV rapid testing (78–84%)

and low short-course AZT uptake and adherence (8–20%). Infant follow-up was limited and potentially biased, so effectiveness of the pilot project could not be determined.

### Training and human resource development:

There was no clear training plan or training strategy, which resulted in a lack of standardization of training methods and content across sites. Training manuals, especially the counselling and infant feeding sections, need to be updated and substantially improved. Staff at all sites reported feeling inadequately trained on infant feeding, family planning and primary prevention. The team noted a lack of training on counselling for disclosure, psychosocial support and bereavement. There had been no evaluation of any of the trainings to determine the quality of the training, and whether staff adequately learned and could implement the content. There was no assessment of the need to conduct ongoing trainings for new staff or refresher trainings at any of the sites. Staff had limited access to project manuals and protocols to review or refer to when new situations or questions arose. Supportive supervision was limited, especially emotional and technical support for counsellors.

### Implementation of counselling and testing:

The voluntary, “opt-in” strategy to counselling and testing impeded coverage. Significantly, all sites successfully implemented rapid HIV testing to give same-day results. Although counsellors were generally well motivated and supportive of the project, pMTCT-related infant feeding, primary prevention and family planning counselling was especially weak. Counsellors independently reported lacking skills in these areas and there was little evidence of organized postpartum infant feeding

counselling. Counselors reported that they did not feel that they had clear and feasible infant feeding messages to give to mothers. Program materials, job aids and scripts for infant feeding and general HIV-related counselling were lacking.

**Infant feeding recommendations:** The original protocol called for infant feeding counseling on safe alternatives to prolonged breastfeeding (replacement feeding, early exclusive breastfeeding and early weaning, avoiding early mixed feeding, etc.), but this appeared to be a weak component at most sites. Although UNICEF planned support for replacement feeding, this did not seem to have been provided. Replacement formula was provided only at one site, where a French organization provided up to 12 months of formula to HIV-positive women who decided not to breastfeed, handling both procurement and distribution. Women who chose not to breastfeed could obtain tablets from the company to stop lactation, were trained to prepare the formula, and given a thermos. (The report does not specify who provides the training and thermos.) Uptake of replacement formula was low (specific data is not provided), reportedly because most women did not disclose their HIV status to their partners and feared disclosure and discrimination related to replacement feeding.

**Monitoring and follow-up:** There was no standardized pMTCT monitoring system. There were many data inconsistencies and staff reported that the collection forms were burdensome and redundant. In addition, the data were not compiled locally or centrally in an accessible database and were not available for local planning or evaluation or to provide feedback to the pilot sites.

**Community awareness and IEC:** Initial sensitisation seminars were held at each site for community leaders as the pilot project began, but the evaluation team found very few on-going IEC and outreach activities and little or no on-going input into the project from the local communities. Community awareness of pMTCT seemed low at all sites. There was a lack of both national and local IEC strategies and materials. Some sites created their own communication materials and pamphlets, but, in general, there was a lack of posters, pamphlets or other educational aids in ANC clinics, including counselling rooms, where sites had direct control and participation in the display of materials.

**Stigma and discrimination:** Staff reported fear of stigma and discrimination were prominent barriers to women's uptake of pMTCT services at all sites. Counsellors reported that the vast majority of women did not disclose their HIV serostatus to their partners for fear of abandonment and violence. These fears and lack of disclosure prevented women from attending counselling, being tested and adhering to the AZT regimen, and also limited their infant feeding choices. Across all sites, male involvement in pMTCT was low and was thought to greatly contribute to women's low uptake of and adherence to services.

## Conclusions and recommendations of authors

Despite a number of significant challenges identified in the pMTCT pilot project, the team concluded that the pilot project demonstrated that it is feasible to implement and scale-up pMTCT services in Tanzania and recommends that the next steps should be to improve pMTCT services at the pilot

sites and expand pMTCT coverage to all 21 regions in mainland Tanzania and to effectively monitor the reduction of HIV MTCT. The high number of unknown status deliveries at all of the sites calls for expanded pMTCT services to benefit all pregnant women in Tanzania and emphasizes the need to 1) explore how pMTCT services can be delivered in the labor and delivery wards and 2) integrate and coordinate pMTCT services in both ANC and maternity services, as well as across different levels of healthcare.

To meet these objectives, the team recommends to:

- Establish strong national pMTCT coordination and management, with regular interactions and standardized reporting
- Implement simple, reliable monitoring systems
- Update and finalize pMTCT policies as well as technical and instruction guidelines
- Improve pMTCT training and skills of healthcare providers by developing a standardized training strategy; updating content, especially related to infant feeding counselling on feeding options; developing a comprehensive training-of-trainers guide; conducting site-specific assessments and evaluations of trainings
- Develop job aids, scripts and counselling guides for pMTCT health providers
- Develop job descriptions for pMTCT staff, provide supportive supervision, as well as emotional and technical support through regular meetings



- Develop and implement IEC strategies to improve community awareness and sensitisation of pMTCT
- Integrate routine counselling and testing and support services into MCH and RCH services (routine, "opt-out" approach)
- Change to a simpler ARV regimen (NVP) to increase uptake and adherence (already under discussion at the time of the review)
- Expand the number of sites offering pMTCT services (regions and districts), with support from referral hospitals as technical and training resources.

### **Methodological considerations/ reviewer's comment**

Various limitations of this rapid assessment were noted by the evaluation team, including: limited time at each site; limited number of interviews with staff and pMTCT partners; few direct interviews with clients; and few interviews with community members or leaders. Copies of instruments used in the evaluation are not included in the report and there is no discussion of their application. Although a secondary objective was to inform the expansion of pMTCT services, the team did not formally evaluate the process or resources required for expansion of activities. The report appears,

however, to provide an objective description of the achievements and challenges in coordination and management, implementation and utilization of pMTCT services at the pilot sites. Despite the stated limitations, the evaluation generated a great deal of valuable information to improve pMTCT at the pilot sites in Tanzania and to expand national pMTCT services and raises important questions about where pMTCT services might be best focused in the future.

# THAILAND

## IF Practice and Attitudes in Northern Thailand (Talawat et al, 2002)

### Document title

Infant feeding practices and attitudes among women with HIV infection in northern Thailand

### Authors

Talawat S, Dore GJ, le Coeur S, Lallemand M

### Institution

National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Australia; Institut National d'Etudes Demographiques, Paris; Institut de Recherche pour le Développement, Chiang Mai, Thailand; Harvard School of Public Health, Boston

### Date

2002

### Country

Thailand

### Document type

Journal article: *AIDS Care* (2002) 14 (5), 625–31

### Source

Author

## Background

Since 1993 the Ministry of Public Health in Thailand has recommended that infants born to HIV-infected mothers be formula fed and has provided free formula to the poorest fraction of the population. However, concern exists regarding spillover of formula feeding into the general population and the risk of discrimination, since formula use may indicate a woman's HIV status. The success of pMTCT interventions such as AZT prophylaxis also will depend on public knowledge and attitudes toward infant feeding.

## Methodology

This study involved two district hospitals

in Chiang Rai province, northern Thailand, where antenatal seroprevalence was 10.8%. Women were routinely offered counselling and HIV testing, with high acceptance rates. HIV-positive mothers were counselled not to breastfeed.

Structured, face-to-face interviews were conducted with 3 groups: 1) HIV-positive mothers (n=80, here 'gp1'), 2) HIV-positive pregnant women (n=36, 'gp2') and 3) pregnant women of unknown status, after pre-test counselling and testing, but before they had received their results (n=86, 'gp3'). Perceived advantages of breast and formula feeding were assessed using a 4-point scale for each category of convenience, cleanliness, low cost and safety.

## Results

Breastfeeding was considered more advantageous than formula. Breastfeeding received near maximum scores in each category, with similarly combined rates in each of the 3 groups: (gp1=11.4; gp2=11.3; gp3=11.4). In contrast, each characteristic of formula was rated much lower (between 2 and 0.5, highest for cleanliness and lowest for cost), and scores differed significantly between groups (gp1=6.8; gp2=5.9; gp3= 5.5; p=0.002). The HIV-positive mothers rated formula significantly higher for safety compared with other groups.

Almost all women agreed that breastfeeding was best for infants, but that HIV-positive women should not breastfeed. HIV-positive women were more likely to identify HIV infection as a reason why women should not breastfeed. When asked their opinion of mothers who replacement feed, 71% of all women said this could indicate that mothers were working outside the home and 45% said this could indicate HIV infection.

In addition, 94% of HIV-positive postnatal mothers were exclusively formula feeding

(5% mixed, only 1 mother EBF); 87% had originally planned to breastfeed, but this dropped to 6% after discovering their status. Most women had worried they could not afford infant formula and were afraid that replacement feeding would disclose their status. Furthermore, 87% were asked by members of their community why they were formula feeding: 27% had responded that they were HIV-positive and 73% had answered that their doctor had advised it or they had insufficient breast milk. Lastly, 83% of women of unknown status planned to breastfeed, but only 25% of antenatal HIV-positive women planned to do so.

## Conclusions and recommendations of authors

Breastfeeding was seen to be more advantageous than formula feeding, yet there was a high level of compliance with the advice to HIV-positive women to formula feed. This may indicate high quality of infant feeding counselling

Knowledge of HIV status had little impact on the perception of formula feeding (higher rating for "safety"). The relatively low number of women of unknown status reporting HIV as a reason for not breastfeeding would indicate that although there is potential for discrimination, the use of infant formula is not exclusively associated with HIV with its inherent negative connotations.

## Methodological considerations/ reviewer's comment

Weakness: Although socioeconomic characteristics were similar between groups, there may have been some bias in the selection of postnatal mothers from the well-baby clinic, as this was a distribution point for formula. Also, there was potential interviewer/subject bias during face-to-face interviews, due to social norms and fear of stigmatisation.

# UGANDA

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## Lessons from Early Cessation of BF in Uganda (Bakaki, 2002)

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### Document title

Lessons and experiences with early abrupt cessation of breast feeding among HIV infected women in Kampala, Uganda

**Author** Bakaki PM

### Institution

Makerere University-Johns Hopkins University Research Collaboration (MU-JHURC)

**Date** January 2002

**Country** Uganda

**Document type** Research Report

**Source** Author

## Background

The HIVNET 012 trial, demonstrating a 47% reduction in MTCT using single dose nevirapine (NVP) to mother and baby, was conducted by Makerere University – Johns Hopkins University Research Center (MU-JHURC) and reported in 1999. HIVNET 012 children are still under observation, and the Mulago Hospital site continues to offer pMTCT with NVP and support for replacement feeding (RF) or exclusive breastfeeding (EBF) with accelerated early cessation, according to MoH guidelines. An infant feeding clinic was set up and 012 trial mothers were invited to attend for more information on infant feeding and support for their infant feeding choice. Most mothers received their baby's HIV infection status by 14 weeks. They were advised to stop breastfeeding by six months and to do it "abruptly", defined as over two weeks.

The purpose of this study was to evaluate the experience of early, accelerated breastfeeding cessation and the lessons learned by health staff in order to improve the help given to HIV-positive women to exclusively breastfeed and accelerate the cessation of breastfeeding.

## Methodology

This was a qualitative study using focus group discussions (FGDs) and key informant interviews (KIs) during December 2002. Research assistants had two days of training by a social scientist and two social workers. Questionnaire guides for the FGDs were pre-tested and changed accordingly.

Inclusion criteria for mothers were: all HIV-positive mothers participating in the infant feeding clinic who had stopped breastfeeding by seven months and lived within 15 km of Mulago Hospital. Totals: FGDs had 37 mothers in six groups. (The number of mothers who refused to participate or who were not available was not stated.) Ten mothers who were active in the infant feeding clinic or who missed the FGDs participated in key informant interviews. Sessions were conducted in the local dialect and tape recorded.

Inclusion criteria for health workers (HWs) were: all involved in the research clinic or in the NVP program. Totals: FGDs had 26 health workers in four FGDs. (One refused and seven were not available.) Participants included three physicians, seven nurse counsellors, nine NVP counsellors, seven research counsellors and nine health visitors. Sessions were conducted in English and tape recorded.

Recordings and notes were reviewed by the moderator and note-taker present at each discussion, transcribed and translated into English as necessary. Identified themes were coded and grouped.

## Results

Mothers ages ranged from 19 to 37 ("most" were 20 to 29); "most" were married with 1-5 children (and "most" of them had 2-3); they were "mostly" housewives.

Age at cessation of breastfeeding was 8 days to 7 months ("most" 6 months; 7 months was an inclusion criterion); single mothers, those employed, and those with fewer than 3 children stopped soonest.

Mixed feeding was practised by "most", especially nearing cessation. The duration was one week to six months (half less than two months, one-fifth two weeks to one month, and three never). Those who stopped abruptly had introduced other foods earlier. Others stopped gradually (e.g., breastfeeding only at night); some left the baby with relatives.

Weaning foods included eggs, potatoes, cow's milk, soya and millet porridges.

Replacement foods were cow's milk, eggs, passion fruit juice, potatoes, groundnuts sauce, bananas, millet and maize porridges, meat and fish soups, etc. (wide variety), including a sieved mix of several different foods taught by the infant feeding clinic staff.

Health workers' viewed early abrupt cessation of breastfeeding as: 1) a new idea, 2) difficult because of worries about the

development of the babies, engorged breasts, babies losing weight, crying, 3) sometimes resulting in resuming breastfeeding (though this did not seem to occur among the mothers in this study), 4) requiring: knowledge, confidence, good relationship with counsellor, 5) a good thing, because it reduces MTCT, 5) having various characteristics: stop at 3 months, stop at 3-6 months, stop over 1-2 weeks, and 6) not being very successful.

Mothers' reasons for cessation of breastfeeding included 1) health education from health workers and 2) being told the baby was not HIV infected.

Mothers' reasons for mixed feeding: 1) getting child used to other feeds and 2) not enough breast milk.

Factors leading to success of early abrupt cessation:

Mothers viewed the following as factors facilitating early abrupt cessation: 1) education and counselling, 2) disclosure of HIV status to husbands and relatives (especially early disclosure: after the antenatal test), and 3) help from relatives and elderly community women.

Health workers believed such facilitation would derive from 1) understanding HIV, related to education level of mother; 2) supportive husbands and relatives, 3) single mothers, because of having no one to criticise them; 4) working mothers, because of having independent financial means; 5) disclosure; and 6) baby's negative results.

Hindrances to early abrupt cessation:

Both mothers and health workers believed the following would hinder early abrupt cessation: 1) stigma; 2) non-disclosure and fear of husbands, relatives, general public; 3) denial, e.g., of baby being uninfected, and 4) poverty and lack of alternative feeds.

Health workers also saw 1) less educated mothers, 2) lack of information (e.g., that babies can survive without prolonged breastfeeding), 3) inconsistent advice from media (e.g., to breastfeed for as long as possible), and 4) cultural beliefs (e.g., shouldn't waste breast milk, or the child will hate the mother) as hindrances.

Problems faced in attempting early abrupt cessation: Mothers and health workers concurred in identifying potential problems: 1) engorged breasts; 2) babies getting sick (loss of weight, diarrhoea, vomiting, fever); 3) difficulties with husband, sometimes to the point of breaking up, frequently to the point of domestic violence; 4) pressure from relatives, in-laws, neighbours; 5) unwanted early conceptions; 6) crying babies; 7) sleepless nights; 8) poor sex life; 9) intimidation from health workers and 10) poverty.

Solutions to the problems:

Mothers and health workers suggested the following to address problems related to breasts: 1) painkillers (aspirin, paracetamol); 2) cold drinks; 3) banana leaf veins tied around the breasts, and other cold compresses, firm brassieres and 4) coffee,

To address questions concerning cessation, it was suggested that mothers lie and say that their baby was sick, the baby refuses milk, they have problems with the breasts,

and/or that health worker advised stopping breastfeeding.

They believe the following would be needed: income generation and education through the infant feeding clinic.

For crying babies they suggested frequent feeds, toys, singing, and grandmother care.

For sick babies they suggested going to the clinic to get treatment, counselling, food supplements, referral to the nutrition unit, and advice on foods.

Recommendations from mothers and health workers were: 1) to involve men, from the time of antenatal care; 2) conduct peer and group counselling sessions; 3) ensure that health workers and mass media advice was consistent; 4) create political will; 5) address income generation and 6) promote nutrition education.

## Conclusions and recommendations of author

The author argues that the baby's negative PCR test (i.e., HIV test) at 14 weeks is not very influential because many (40-60%) mothers at other centres (which do not offer PCR testing) also choose formula feeding at delivery. He also argues that the perception of "inadequate milk" can be used to advocate early cessation. Although mixed feeding was very common, he considers that it was not problematical because only one of 49 babies born to the mothers in the study "was thought" to have been HIV infected through breastfeeding. The basis for this is not given.

The author recommends 1) uniformity of advice at all levels; 2) major public awareness campaign on early cessation; 3) involving men, with man-friendly hospital services; 4) providing VCT for couples; 5) conducting family and marital counselling as part of pMTCT follow-up; and 6) close follow-up (counselling, growth monitoring, nutrition education, food supplementation, and curative services).

### Methodological considerations/ reviewer's comment

**Strengths:** This was a very detailed exploration of the views and experiences of mothers and health workers trying to find ways to successfully achieve early abrupt cessation of breastfeeding.

**Weaknesses:** The study was limited to an urban setting with mothers (and babies) receiving very intense input including research study-based curative services and the provision of infant HIV diagnosis. The cost of the inputs was not assessed.

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## Experience with Providing Free Formula in Uganda (Matovu et al, 2002)

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### Document title

Experience of providing free generic infant formula to mothers in the nevirapine implementation program at Mulago hospital in Kampala, Uganda.

### Authors

Matovu JN, Bukonya R, Musoke PM, Kikonyogo F, Guay L

### Institution

Mulago Hospital, Kampala; Makerere University, Uganda; Johns Hopkins University, USA

### Date 2002

### Country Uganda

### Document type

1) Abstract MoPeE3748 from Barcelona AIDS Conference 2) Presentation to EGPAF Call to Action (CTA) meeting in Zambia, August 2002, and 3) Personal communication from Laura Guay, January 2003

### Source

Barcelona Abstracts CD and authors

## Background

The Mulago Hospital in Uganda did not, at first, provide free formula in its pMTCT program. When it became a UNICEF/UNAIDS pilot site, however, a six-month supply of free generic formula was provided to women who decided not to breastfeed, beginning in April 2000. As of September 2002, free formula is no longer offered.

Infant feeding counselling is offered to all women, with HIV-positive women involved in an ongoing counselling process with trained counsellors assisted by midwives. There are multiple counselling opportuni-

ties for education (in the antenatal clinic, labour ward, postnatal ward, postnatal clinic), discussion of options, and support for the woman's decision. An infant feeding (IF) checklist has been established to help in determining whether formula would likely be a safe and successful choice. This includes: 1) socio-cultural (i.e., family, neighbour, community) acceptance; 2) economic factors (cost of preparation, supplies, replacement after the end of free supplies); 3) logistics (fuel, supplies, time, night feeds) and 4) hygiene (water source, utensils, storage). Examples of questions include: What will you do when the baby wakes up in the middle of night for food? How will you prepare the formula and feed the baby when you have no electricity and the crying baby is waking up the family? What will you do on a bus when the baby cries and everyone tells you to put the baby to the breast? What are you going to tell your husband whom you haven't told your HIV results to? How will you feed your baby when you have to go to the village for a burial?

Generic formula in cardboard boxes complete with scoops (for powder and water), produced in France, was supplied by UNICEF. Problems related to the distribution of formula included: lack of storage space, difficulty in carrying cases of formula, expiration of formula, contamination, stealing, and supply interruptions.

In the pMTCT program, mothers are asked to return at six weeks for HIV PCR testing (HIV testing) of their babies and to obtain additional formula. With passive follow-up, only 50% (formula feeders and breastfeeders) returned, presumably meaning that many formula feeding women reverted to breastfeeding or mixed feeding. Active follow-up was initiated in August



2001 with the objectives of 1) improving follow-up of infants receiving free formula and 2) better assessing the impact of formula on MTCT.

## Methodology

All mothers leaving the hospital with formula were asked to participate in the active follow-up program. Women who accepted were visited every two weeks by a health visitor who monitored progress and offered advice and feeding support.

## Results

Barcelona abstract: From August 8, 2001 to December 31, 2001, 69 women (data on the total number of women is not included) chose to use infant formula. Twenty-one (30%) refused active follow up. Of these refusers, eight (38%) did not return at 6 weeks. Out of the 13 (62%) who did return, one infant was HIV-infected. Forty-eight (70%) women accepted active follow up. Nine (21% of the 43 due to return) did not attend at six weeks; two infants were HIV-positive.

CTA presentation: Of the 870 HIV-positive women who delivered, 495 chose exclusive breastfeeding (EBF) and 375 chose formula. Of these 375 women, 279 were provided with free formula from delivery. Of the 222 women scheduled for a 6-week (or later) follow-up, 78 (35%) never returned, 49 (22%) completed 6 months of formula, 48 (22%) had not yet reached six months but were up-to-date, and 47 (21%) had returned but then defaulted. It was not

reported what proportions were being "actively" followed up.

Personal communication: Women who succeeded with replacement feeding using infant formula were better educated and had family support (no figures provided). Those who went home breastfeeding, returned at six weeks for their scheduled follow up, whose babies were tested and found to be HIV-negative, and subsequently chose to switch to formula feeding were the most likely to return for their supply of free formula. One possible explanation is that, perhaps, it is easier to find a reason to stop breastfeeding rather than to never breastfeed. It should be noted, however, that these were particularly motivated women who had returned for follow-up and wanted to know their babies' HIV test results.

## Conclusions and recommendations of authors

Both women and staff lacked knowledge and IEC (information, education and communication) materials to support counseling about formula feeding. They might know about hygiene but did not know about 1) how often to feed the baby, 2) how much a baby should drink in a day, 3) what formula-fed infant stools are like compared to a breastfed infant's, etc. There was low acceptance of formula among women, the community and health workers. Providing free infant formula seems to increase the opportunity for, or the likelihood of, mixed feeding. Although not formally established because of the poor fol-

low-up, transmission rates seem to be the same or even higher in the replacement feeding group than in the breastfeeding group.

Personal communication: Provision of free infant formula cannot be done without active follow-up. Locally produced infant formula is probably a better option than imported. There are significant numbers of women and infants who could benefit from access to free infant formula and related support. However, the majority of current health care systems and families are not ready for such programs in the absence of significant investment in resources, training, manpower, etc. to handle infant formula procurement, distribution and counseling on its safe use.

## Methodological considerations/ reviewer's comment

This is a work-in-progress, rather than a formal reporting of a research study. The low rate of follow-up presents a significant methodological problem, which is in and of itself an important finding.

These reports from the Mulago Hospital do not claim to be a formal assessment of the effectiveness of provision of free formula in terms of infant health or HIV transmission rates, or of other issues such as "spillover" (although the impression was that there was little sign of spillover). They do, however, reflect considerable experience, and the warnings about providing free formula are valid even without formal numerical corroboration.

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## Stigma, HIV/AIDS and pMTCT in Zambia (Bond et al, 2002)

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### Document title

Breaking the silence, ending the stigma: stigma, HIV/AIDS and prevention of mother-to-child transmission in Zambia

**Authors** Bond V, Chase C, Aggleton P

### Institution

ZAMBART Project, London School of Hygiene and Tropical Medicine, Lusaka, Zambia; Institute of Education, University of London

**Date** 2002

**Country** Zambia

### Document type

Article in press  
(*Evaluation and Program Planning*)

**Source** Author

## Background

HIV/AIDS-related stigma and discrimination are known to negatively impact all efforts at prevention, diagnosis, treatment and care. This project assessed the complexities of stigma across 4 countries and reports on results from Zambia in particular.

## Methodology

The project aimed to 1) assess both perceived and enacted stigma among health care providers, those receiving care and decision makers; 2) analyse the origins of stigma, especially surrounding MTCT; and 3) inform the development of a wider information programme about stigma in order to help alleviate it. The research was conducted in a rural community 170 km south of Lusaka, on the border with Zimbabwe. Evidence was gathered through

focus group discussions (FGDs) with service providers, as well as male and female service users, and through key informant interviews. This summary focuses only on issues relating to MTCT and infant feeding.

## Results

Uptake of the MTCT intervention (VCT, ARV and pre- and postnatal counselling) was low after nearly one year of service provision at the local mission hospital. Stigmatisation and the fear it provokes can prevent women from participating effectively in pMTCT programmes. Staff at two rural health centres were unaware of the pMTCT programme at the hospital and said that HIV was discussed at antenatal clinic only if a mother presents with obvious symptoms.

Pregnant women with HIV have become the main focus of HIV in this rural community, with many respondents stating that pregnant women falling sick and their babies dying had made HIV/AIDS visible. Herpes zoster or emaciation in a pregnant woman is considered diagnostic of HIV infection and enough reason to shun her.

There was little sympathy for pregnant women with HIV, who are assumed to be sex workers and/or promiscuous and therefore deserving of blame and rejection. This is in sharp contrast with another rural community with an established pMTCT intervention, where health education and an improved package of care had helped to reduce community stigma.

Midwives and traditional birth attendants (TBAs) reported delivering infants of HIV-positive women without minimum precautions, due to lack of supplies and an inability

to refuse to help, especially since women were sometimes denied help in the clinics or were discharged from hospital while very ill and HIV-positive.

There were few incentives for pregnant women to test for HIV, unless they suspected their partner, had a chronic illness or were following the doctor's recommendation. The resulting likely stigmatisation following a positive result was seen to outweigh the advantages of testing and women often feared depression, had suicidal feelings, considered an abortion and feared reaction of their partner and family, believing they will be abandoned and ignored, isolated and openly disgraced. It is only considered safe to divulge status to one's own mother, as she will always care for her child.

Not breastfeeding is seen as an indication of positive status and causes stigmatising, yet women who continue to breastfeed are accused of killing the child. In response, women just pretend they are HIV-negative and breastfeed as usual.

Recommendations around infant feeding revealed mixed messages. Some women had heard from the local mission hospital that HIV-positive mothers should not breastfeed, as their breast milk contained "germs" and reduced the baby's chance of survival. However, a senior traditional healer and headman thought that babies should be exclusively breastfed, because formula is not good for babies.

## Conclusions and recommendations of authors

pMTCT programmes should take into account the extent of fear, misconception and

resulting stigma in the community, and they should be integrated into preventive, education, care and support initiatives that address these fears. Communities need wider implementation of pMTCT and VCT services.

## Methodological considerations/ reviewer's comment

This study conducted FGDs with a variety of service providers and users in one particular area of Zambia, so findings may not be applicable elsewhere.

## Formative Research on MTCT (NDHMT, 1999; Bond and Ndubani, 1999)

### Document titles

1) Ndola Demonstration Project to integrate infant feeding counselling and HIV voluntary counselling and testing into health care and community services. A summary of the findings and recommendations from the formative research carried out in Lubuto, Main Masala, Twapia and Kabushi Health Center areas, Ndola, Zambia 2) Formative research on mother to child transmission of HIV/AIDS in Zambia

### Authors

1) Ndola District Health Management Team 2) Bond G and Ndubani P with Nyblade L

### Institution

1) National Food and Nutrition Commission; Ndola District Health Management Team; LINKAGES Project; SARA Project 2) ZAMBART Project, School of Medicine, UTH, Zambia; Institute for Economics and Social Research (INESOR), UNZA, Zambia; International Centre for Research on Women (ICRW), Washington

### Date

1) April 1999. 2) November 1999

### Country Zambia

### Document type

1) Manuscript submitted for publication, 2) Working Report

### Source

1) National Food and Nutrition Commission, Ndola District Health Management Team, 2) UNICEF ESARO CD

## Background

These two reports provide information on two separate formative research projects to assess the readiness of Ndola, Zambia, for pMTCT programmes. The first (herein-

after NDHMT) was conducted from December 1998 to February 1999, and the second (Bond and Ndubani) was conducted in November 1999.

NDHMT's objective was to develop locally appropriate and feasible infant feeding recommendations for HIV-positive mothers and families living with HIV in urban Zambia.

Bond and Ndubani conducted a pre-UNICEF pilot site feasibility assessment in a poor rural area. It sought to 1) better understand women and community views about MTCT of HIV; 2) assess local beliefs and perceptions about drug use during pregnancy and breastfeeding; 3) determine potential social, cultural and economic factors that would likely affect women's participation in the MTCT program; 4) identify existing social and community networks relevant to the MTCT implementation; and 5) recommend strategies to facilitate effective implementation of the MTCT programme.

## Methodologies

NDHMT conducted six focus group discussions (FGDs): two each with mothers and fathers of children under two years and one each with HIV-positive women and HIV-positive men. They also held semi-structured key informant interviews (KIs): 33 with mothers of children under two years, mothers support group members and members of the neighbourhood health committee, 22 with health workers, six with traditional birth attendants (TBAs), one with an HIV counsellor and one with a caregiver at an orphan transit home. Household interviews included observation and cooking demonstrations, and 28 household trials of improved feeding and caring practices in-

cluded trials of milk and replacement food preparation.

Bond and Ndubani held nine FGDs of 6-14 participants, as well as participatory research and unstructured observations. Participants included pregnant women and breastfeeding mothers attending under-five or antenatal care clinics at a health centre, men who were invited through local churches and community leaders.

## Results

Both research teams found high levels of HIV awareness and concern about stigma, recognition of health centres as sources of information, and valuing breastfeeding and seeing it as the norm. NFNC reported that care-seeking starts at home, while Bond and Ndubani noted that orphans are usually cared for by the family despite affordability and feasibility challenges.

NDHMT reported 1) problems with the health delivery system (fees, drug and staff shortages, distances and lack of confidentiality); 2) that good counselling is important and means nice, supportive, a private room, no public disclosure, and medicines; and 3) very early (a few days after birth) introduction of alternative foods, including maize meal porridge, sweet beer, nshima mashed in soup/sauce, beans, beef, cow and goat milk, eggs and fruits and that concern about affordability of these foods was substantial.

Bond and Ndubani's found 1) that most women do not work outside the home, 2) that people believed that HIV and AIDS were equivalent and knew of MTCT, 3) that breastfeeding is usually for 18 to 24 months with water and porridge (usually in insufficient amounts) being introduced at two

or three months, and 4) the most feasible aspects of infant feeding (IF), included cup feeding, boiling water for mixing with formula and cleaning utensils, and the use of 'long-life' milk for babies over six months.

## Conclusions and recommendations of authors

NDHMT focused on clinical care and recommended: 1) IF advice and counselling for all women; 2) propagation of the BFHI; 3) de-stigmatisation of HIV; 4) expansion and publicising of VCT; 5) assurance of confidentiality; 6) expansion of support for HIV-positive people; 7) more information on living positively with HIV; 8) increased information on MTCT; 9) consistent messages on breastfeeding; 10) IF counselling, based on informed choice and support (considering the risk of transmission through breastfeeding, of replacement feeding, of social stigma) for that choice, to start in ANC; 11) more hand washing; 12) monitoring of "spillover"; 13) that HIV-positive women choosing to breastfeed: a) exclusively breastfeed until 6 months, b) discontinue feeding from a breast affected by mastitis or cracked nipples (express and discard the milk); c) treat babies' oral lesions immediately (express and heat-treat breast milk); and d) if mother gets sick, go for treatment immediately; 14) HIV-positive women choosing not to breastfeed should: a) feed formula for first six months (because, compared to cow's milk, comparable cost, simpler, better known, more likely to be given to the baby only, storage better), but very expensive, likely to be overdiluted, not always available; b) use cup; c) develop strategies for night feeds; d) address the dangers of storage of formula; and e) monitor; 15) babies six months and older not breastfeeding should receive: a) vitamin supplement and porridge enriched with milk, oil, sugar, groundnuts,

kapenta, vegetables, beans, beef); feedings 200-300 ml (increase with age); b) cow's milk of at least 100 ml at least twice a day; c) nshima with mashed solid foods (not just soup); d) fruits, beef, fish if possible; and e) continue feeding during illness.

Bond and Ndubani focused on programming issues and recommended that programs: 1) facilitate a successful MTCT intervention by simultaneously addressing prevention, care, support and stigma; 2) enhance capacity to regain control in order to overcome feelings of hopelessness (with appropriate outside organisations, including existing local structures, helping communities cope); 3) improve inadequate existing health services, especially through health worker training (addressing the lack of confidence that is justified by breached confidentiality; limited capacity of health workers; lack of equipment, supplies and medicines; secrecy and innuendo that perpetuate stigma; poor delivery care and poorly conceived communication strategies); 4) include households, since they play key roles in care seeking for serious illness, prevention, maternal health, VCT, etc., winning their full (all members') co-operation; 5) address the many sensitive issues related to gender, which are not being handled correctly; 6) apply and exchange knowledge so that program designs address the real barriers and fears (e.g., knowing one's HIV status); 7) incorporate local discourse into communication strategies; 8) support improved breastfeeding practices—challenging the early introduction of feeds other than breast milk is likely to be easier than the introduction of infant formula; and 9) promote the most feasible IF methods, which probably include cup feeding, boiling water to make formula and clean utensils, and using "long-life" milk for babies over six months.

## Methodological considerations/ reviewer's comment

These studies are dated but offer important insights relevant to the implementation of a pMTCT programme.

**NDHMT Strengths:** The study provides detailed exploration of prevailing attitudes and practices around IF and HIV.

**NDHMT Weaknesses:** The setting was urban only.

**Bond and Ndubani Strengths:** This well-written report contains a wealth of background information. Economic and especially anthropological detail frames the discussions of community perceptions of HIV/AIDS and potential coping mechanisms.

**Bond and Ndubani Weaknesses:** This small, time-constrained study is limited in the variety and quantity of data collected, the location for conducting interviews, the selection of focus group participants, as well as the time available to find and train FGD leaders. The findings and conclusions are limited to the local community (Keemba), which the authors note is a unique setting, different in some respects from the rest of the province. The study was conducted in order to inform the imminent introduction of pMTCT programs in Zambia and did not address IF issues in detail.

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## Ndola Demonstration Project (Hope Humana et al, 2002; AED/Linkages Project 2002 a and b)

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### Document titles

1) Ndola Demonstration Project: A Midterm Analysis of Lessons Learned; 2) Zambia Integrated PMTCT Program; 3) LINKAGES/Zambia PMTCT Results Reporting

### Authors

1) Hope Humana, AED/LINKAGES Project, National Food and Nutrition Commission, Ndola District Health Management Team, HORIZONS Project, Zambia Integrated Health Project (aka "Horizons"). 2) AED/LINKAGES Project. 3) AED/LINKAGES Project

### Institutions

1) The Population Council. 2) Academy for Educational Development (AED). 3) AED

### Country Zambia

### Dates

1) November 2002. 2) September 2002. 3) December 2002

### Document types

1) Horizons Project - Midterm evaluation report. 2) AED/LINKAGES Project – Newsletter. 3) AED/LINKAGES Project - Memo reporting results

## Background

In 1997 the Zambian National Food and Nutrition Commission (NFNC) initiated the development of a national program in MTCT. Its aim was to prevent MTCT in low-resource settings where MCH and ANC were carried out, especially through integrated approaches that involved infant feeding. During 1998–99, formative research was undertaken in four sites, and the methodology and results of two of these are summarized elsewhere in this compilation. As a result of this research, the Ndola Dem-

onstration Project (NDP) was started in 1999 in Ndola District by the Ndola District Health Team under the auspices of the NFNC and the Central Board of Health of Zambia, with partial funding from USAID. Technical assistance contractors including AED (The Linkages and SARA Projects) and the Population Council (Horizons). The NDP demonstration was successful and expanded to other parts of the Ndola District in 2000 and 2001. The NDP is listed as one of five projects in UNAIDS Best Practices Collection.

Considerable data were collected about the NDP, at baseline, midterm, and end-line. Although local conditions dictated different interventions at different sites, many of the findings were similar. In this review we summarize three reports on the NDP: 1) "Ndola Demonstration Project: A Midterm Analysis of Lessons Learned," November 2002, by the Horizons Project (herein referred to as the Horizons' midterm evaluation); 2) "Zambia Integrated PMTCT Program," September 2002, World Linkages by AED (herein referred to as the AED/LINKAGES Newsletter); and 3) "LINKAGES/Zambia PMTCT Results Reporting," December 2002, by the AED/LINKAGES Project (herein referred to as the AED/LINKAGES Report). We refer to these documents as the "Horizons Midterm Evaluation," the "WL Newsletter," and the "AED Report," respectively. (*A preliminary unedited final report by HORIZONS containing end-line data entitled: "Empowering Mothers to Respond to HIV: Ndola Demonstration Project Final Report", became available as this document went to press. It is referred to briefly here.*)

While the three documents touch on overlapping aspects of the NDP, they also underscore different ones. The Horizons' midterm evaluation identifies five key compo-



nents: 1) strengthening routine services, 2) introduction of VCT and pMTCT (including IF counselling) into ANC/MCH settings, 3) promotion of EBF for HIV-negative and HIV-unknown status women, and information about different feeding options and guidance through social/economic influences for HIV-positive women, 4) optimal obstetric practices, and 5) increased community involvement including couple counselling. It notes that IF was included in ANC, in pre- and post-test counselling, and after delivery.

The Horizons' Midterm Evaluation states that the centerpiece of the pMTCT program is IF counselling, the most innovative aspect of the Ndola Demonstration Project. Both the Horizons' and the AED Reports indicate that both HIV-negative and HIV-unknown women are counselled to EBF for six months and to continue breastfeeding for two years; that HIV-positive women are counselled to exclusively breast-milk feed for six months with heat treating and cup feeding; and that all women should avoid mixed feeding, prevent HIV and unwanted pregnancies, and introduce complementary feeds at six months. The Horizons' Midterm Evaluation says NDP interventions included enlargement of ANC space, plus adequate equipment and supplies, although shortages of supplies continued. Staff and community health workers received substantial additional training: 99 health workers and their supervisors took a two-week course that included HIV epidemiology, IF and lactation management, pMTCT during delivery, postnatal care, maternal health and VCT; 104 community health workers (mothers, local committees, TBAs, promoters) took a modified course; and 47 of these took additional counselling training (an eight-week course, according to the AED/LINKAGES Newsletter).

The AED/LINKAGES Newsletter stresses the integrative nature of the Ndola intervention: IF is integrated with VCT, pMTCT, and HIV testing in the ANC/MCH setting. It states that behaviour change communication (BCC) and training are prominent components of the NDP. BCC includes assertive, data-based approaches to behaviour change, radio spots and print materials, and community "ambassadors against AIDS." The training described in the Horizons Evaluation is noted, along with a six-day training of trainers (TOT). The AED/LINKAGES Report notes that Nevirapine was introduced in NDP in 2002.

## Methodology

The Horizons' Midterm Evaluation reports baseline (April-May 2000) and midterm (April-May 2001) data in six sites that received the NDP interventions. Household KAP questionnaires provided information on IF, MTCT, MCH, VCT, and HV from mothers, other community members, and health workers. The attached table gives sample sizes reported by the Horizons' Midterm Evaluation.

The Horizons' Midterm Evaluation describes the types of statistical analysis used in the report but not the method used to obtain feeding practice. The AED/LINKAGES Newsletter gives an historical review of the project, but nothing on the methods used in the evaluation. The AED/LINKAGES Report includes some data from the end-line survey (January-November 2002) that is compared to baseline and midterm data. It also gives updates on persons trained through 2002, various services provided in the clinics and districts, and sources of funds. It notes that the home interview of mothers (community survey) about infant feeding 0-6 months is based on a 24-hour recall (*Editors note: 24-hour recall is known to over-estimate the rate of EBF*).

## Results

The Horizons' Midterm Evaluation compares baseline to midterm results for many variables. Community members' knowledge of MTCT during pregnancy, delivery, and breastfeeding increased significantly. Awareness of free VCT services among all community members increased from 45% to 75%, while HIV testing among all re-

Survey	Sample Size		Selection Method
	Baseline	Midterm	
Clinic survey:			
Mothers of infants 0-12m	460	185	Exit interview with every 4th woman who uses ANC or EPI in week 1.
Pregnant women	125	125	
Community survey:			
Adult females	385	441	At baseline ask if the interviewee knows a neighbor with baby; at midterm random selection using census.
Adult males	251	232	
Mothers of infants 0-6m	209	319	
Health worker (HW) interviews: # of interviews	62	65	All staff at clinic and collaborating CBOs.
Client-HW observations: # of observations	469	392	(Selection method not clear.)
Qualitative cohort	59 mother-baby pairs		Quarterly follow-up. Data not yet available.

spondents increased from 5.2% to 9.8%, statistically significant for women with infants 0–6 months but not for other women or males. Proper breastfeeding increased: 58% of mothers initiated breastfeeding early (within one hour of birth) at baseline compared to 82% at midterm; EBF in the first 6 months rose from 71% to 85% among HIV-unknown women and from 56% to 76% in HIV-known women. The report does not distinguish between HIV-positive and HIV-negative women. Although knowledge of early weaning as a means of reducing the risk of MTCT had increased, nearly all women (known and unknown HIV status) with infants 6–12 months were still breastfeeding. Condom use among community members stayed the same (13%), while women reporting 2 or more sexual partners in the last year decreased from 9% to 3%. Men reporting 2 or more partners increased insignificantly (69% to 72%).

Health worker training in HIV and STI increased significantly, but not in lactation management or family planning. Their knowledge and practices related to pMTCT during breastfeeding showed little change in most ways. The exception was an increase in post-test client sessions where MTCT and IF were discussed with HIV-positive mothers, rising from 33% to 100%, although the number of sessions observed was very small (12 baseline, 5 midterm). The Horizons' Midterm Evaluation reports that attendance at ANC during the current or previous pregnancy rose from 91% to 96%, but women reporting 4 or more visits remained at 71%. Hemoglobin tests offered, syphilis tests given, and iron folate prescribed at ANC sessions did not increase significantly, possibly due to logistic problems, but iron folate for all mothers and pregnant women in the community did increase (15% to 38%). Increases were ob-

served in postnatal vitamin A (33% to 61%), use of sterile gloves (64% to 75%), and availability of piped water (67% to 100%), but hand washing by health workers decreased (26% to 15%). *(The Horizons' Midterm Evaluation notes that while substantial improvements were apparent in many indicators of performance between the baseline and midterm surveys, progress seems to have plateaued for most indicators between the midterm and end-line surveys. Exceptions may be knowledge of VCT scores and discussion of HIV risks, which continued to improve through the end-line.)*

The AED/LINKAGES Newsletter reports that early initiation of breastfeeding rose to 89% at end-line (compared to 53% and 85% at baseline and midterm), and that EBF among 0–6 month olds rose to 85% in all women (compared to 73% and 84% at baseline and midterm), with HIV-known women going to 90% and HIV-unknown to 84% at end-line. Infants 0–5 months having diarrhea in the previous 2 weeks dropped from 8.6% at midterm to 6.1% at end-line. The AED/LINKAGES Report reiterates the Horizons' Midterm Evaluation about breastfeeding practices. It also notes that the uptake of VCT had increased by the end-line survey.

## Conclusions and recommendations of authors

The Horizons' Midterm Evaluation concludes that: 1) Although MTCT improved, more is needed. Health workers and community members should be made more aware of ARVs. 2) Increasing knowledge of MTCT did not erode good breastfeeding practices. NDP increased early initiation and EBF. 3) The increased practice among HIV-positive mothers of choosing EBF over replacement feeding suggests that stigma

and cost are responsible. 4) HIV-positive mothers are not changing from EBF to replacement feeding at 6 months; they are still breastfeeding at 12 months. More effective counselling is needed about cessation of breastfeeding and replacement feeding. 5) There is a need to develop a tool to improve service delivery. 6) Efforts should continue to train health workers in IF counselling at ANC. 7) Comprehensive systems for monitoring IF and counsellor supervision should be organized. 8) Innovative ways to reach men about HIV, including couple counselling, should be explored. 9) Supply problems with VCT were overcome, but uptake remained low because it is viewed as source of stress. The program should explore how the benefits of VCT can be made relevant and how demand for it can be increased. 10) Disclosure of HIV status remains low. Strategies should be explored to increase disclosure, such as couple counselling and more skills for women. 11) Routine ANC must be strengthened, including infrastructure, training, and logistics. 12) All ANC should provide anemia testing, iron and folic acid supplementation, malaria prophylaxis, and syphilis testing and treatment. 13) NDP requires community links. Referrals should be given to community-based organizations (CBOs) as well as hospitals. *The Horizons' Midterm Evaluation report hypothesizes that the initial improvement noted in its midterm report was due to the energy generated in the staff by the training program; ways to maintain that enthusiasm should be found.* The Horizons' Midterm Evaluation notes some of the important limitations of the study, including: lack of a comparison group, problems in measuring the strength of the NDP intervention in relationship to other related efforts in the study area, and potential influences of other efforts in the study area.

The AED/LINKAGES Newsletter does not provide conclusions or recommendations per se, but the following statements are implied in their discussion: 1) The NDP has been successful in many ways. 2) The integrated approach that NDP has used, incorporating ANC and MTCT, is a key factor in its success. 3) Some key factors contributing to its success include early formative research, policy involving national infant feeding and the Code of Marketing Breastmilk Substitutes, assertive behavior change strategies, training, and evaluation.

Conclusions of the AED/LINKAGES Report include: 1) NDP depended on the ownership of the program by the involved local and national organizations of Zambia. 2) Local situational analyses and formative research are essential. 3) Follow-up to trainings, with on-the-job mentoring is critical. 4) The integrated approach involving partners from the very beginning is vital. 5) Gender inequality remains a major issue: empower women and incorporate men. 6) Focusing on quality, integration and informed choice will increase VCT uptake. Higher uptake of VCT requires dynamic programs that allow for testing and/or opt-out models. 7) Use research to test interventions and assess outcomes. pMTCT projects should appoint a staff person and plan evaluation indicators from the start.

8) Knowledge of EBF increased but remains low, indicating a need for more EBF education. 9) Routine ANC requires more resources. 10) Focusing on quality, integration and informed choice will increase VCT uptake. Higher uptake of VCT requires dynamic programs that allow for testing and/or opt-out models. 11) Community links need to be strengthened.

Recommendations for scale-up of the NDP included: 1) explore ways to invest in health workers and clinic infrastructure to provide routine and improved services; 2) find innovative and effective ways to reach men and youth through community education and couple counselling; 3) develop consensus and partnerships with local stakeholders in behaviour change communication strategy based on formative research; 4) address demand-side factors affecting VCT uptake; and 5) strengthen routine MCH services as an integral component of pMTCT, in addition to providing enhanced services for programme components.

### **Methodological considerations/ reviewers comments**

This complex intervention has been subjected to a fairly extensive and detailed before-and-after evaluation. The Horizons'

Midterm Evaluation is comprehensive and particularly well written. This careful study overlaps with the other two documents, which also present additional data and sometimes alternative views. The final report, when complete, should add to our understanding of the impact of this project. It is clear that the authors of all three documents consider the intervention a success, although only the AED/LINKAGES Report presents cost data and none formally address the problem of sustainability.

The Horizons' Midterm Evaluation correctly identifies some of the important methodological limitations of their study: lack of comparison group, problems in measuring the strength of the NDP intervention in relation to other related efforts in the study area, and the potential influences of other efforts in the study area. The lack of information given to mothers about replacement feeding is of concern, especially because a goal of the program was to enable women to make an informed choice. The expansion of the program to other areas may provide additional insights about replacement feeding and other issues such as cost. The introduction of Nevirpine into the program will likely alter the uptake of VCT and even choices of infant feeding, depending on the counsellor's approach.

## Infant Feeding Practices in Zambia (Omari et al, 2000)

### Document title

Infant feeding practices of mothers of known HIV status in Lusaka, Zambia

### Authors

Omari AAA, Luo C, Kankasa C, Bhat G, Bunnr J

### Institution

University Teaching Hospital, Lusaka, Zambia; Liverpool School of Tropical Medicine

Date 2000

Country Zambia

### Document type

Report of research study

Source ESARO CD

## Background

Zambia's national HIV prevalence is 12-24%, and its peri-natal transmission rate is 39%. Antenatal coverage in Lusaka is 96%, but very few mothers are not breastfeeding.

The aims of the study included 1) comparing the infant feeding (IF) practices of HIV-positive mothers with those of HIV-negative mothers and 2) determining the pattern of breastfeeding and the use and appropriateness of breast-milk substitutes, other liquids and complementary foods.

## Methodology

Participants were recruited from the Family Support Unit at the University Teaching Hospital (UTH) where mothers are invited to join ongoing research work. Mothers attending the follow-up clinic (which provides free medical care) between April and June 2000 were invited to participate in

this study. Inclusion criteria were 1) known HIV status and 2) baby 12 months old or less. During those 3 months, 561 mothers attended (177 [36%] were HIV-positive): 152 were invited to participate; 140 were recruited: the selection was 'opportunistic'. 'One-on-one' interviews were held in the vernacular using a structured questionnaire.

## Results

Of 140 mothers, 121(86%) knew their status, 10 did not want to know and 9 were waiting to be told; 55 (39%) were HIV-positive (HIV+) and 85 (60%) were HIV-negative (HIV-).

Mothers	HIV+	HIV-	p
Average age	27	25	0.04
Married	75%	86%	0.09
Live children	2.4	2.3	
Education			
None	4%	3%	0.43
Primary	44%	39%	
Secondary	49%	53%	
Tertiary	4%	6%	
Employed	26%	21%	0.55

Babies' ages ranged from 2-12 months (median 6 months). The Weight for Age Z score of babies of HIV-positive mothers was -0.22 and of babies of HIV-negative mothers was +0.41(p = 0.004).

**MTCT knowledge:** 85% of mothers knew of HIV transmission through breast milk; all (except one who stopped at eight months when his HIV-positive mother started anti-TB treatment) were breastfeeding; 25% of HIV-positive mothers had been advised to stop breastfeeding.

**Feeding practices:** 35% of mothers with babies four months or less were exclusively breastfeeding (definition or methodology not reported); 'most' planned to breastfeed for two years (median 20.5 months); 12% of HIV-positive mothers (cf 2% of HIV-negative) planned to breastfeed for less than 12 months; 31% of HIV-positive mothers (cf 8% of HIV-negative) planned to breastfeed for 18 months or less. Of babies 4 months or more, 52% had started on other liquids by four months; 28% of babies of HIV-positive mothers (cf 11% of babies of HIV-negative) started other liquids before two months (p=0.03).

**Water quality:** 52% of households boiled water, 38% added chlorine, and 27% did neither.

**Introduction of complementary food (mostly maize porridge)** was as follows: 15% by 2 months, 60% by 4 months (median 4 months); introduction was earlier in babies of HIV-positive mothers (p=0.002). Reasons for introducing complementary food were 1) baby crying and 2) 'insufficient breast milk'.

**Breast-milk substitutes (BMS):** 36 (26%), including 16 HIV-positive mothers, were using or had used BMS. Median age at introduction was 2.5 months. Commercial formula was used by 23 mothers (8 HIV-positive); 13 used fresh cow's milk (two added sugar, one added salt, none added water). Of 29 mothers, 20 used a bottle and teat.

## Conclusions and recommendations of authors

The authors conclude that 1) mothers were aware of the risk of HIV transmission through breastfeeding, 2) breastfeeding

HIV-positive mothers intended to breastfeed for a shorter period than HIV-negative mothers, but did not, 3) HIV-positive mothers introduced other liquids and complementary foods earlier, often at less than 2 months; 4) no mother correctly modified cow's milk; and 5) well babies of HIV-positive mothers showed poorer growth than those of HIV-negative mothers (perhaps because of earlier introduction of other foods: author's suggestion). That is, HIV-positive mothers may be changing their infant feeding practices for the worse.

### Methodological considerations/ reviewer's comments

**Strengths:** This study examined actual infant feeding practices of HIV-positive mothers (who had been counselled, tested and were receiving ongoing support).

**Weaknesses:** The report provides 1) no assessment of infant HIV status (to make sense of weight for age Z score), and 2) the reasons for infant-feeding decisions were not elicited in detail.

## Rapid Assessment of pMTCT in Zambia (Kankasa et al, 2002)

### Document

Report on the Rapid Assessment of the UN-supported PMTCT Pilot Program in Zambia

### Authors

Kankasa C, Mshanga A, Baek C, Kalibala S, Rutenberg N

### Institution

Population Council/HORIZONS Project

**Date** December 2002

**Country** Zambia

### Document type

Program Report  
(under review, not for circulation)

**Source** UNICEF Headquarters

### Background

Nearly one million adults and 150,000 children were infected with HIV in Zambia by the end of the 2001. MTCT of HIV is responsible for more than 90% of HIV infections in children. Each year, more than 20-30,000 HIV infected women give birth, without an intervention and over a third of these women will pass on the infection to their infants. The Zambian MOH established the pMTCT program in January 1999, along with an interagency National pMTCT Working Group (pMTCT-WG), with representatives of the MOH, the National AIDS Council, National Food and Nutrition Commission, universities, NGOs, UN and donor agencies, the CDC and Linkages. The pMTCT-WG has standing subcommittees addressing training, IEC, program guidelines, research proposal reviews and dissemination. Coordination occurs through monthly meetings. Horizons/Population Council provides funds and technical sup-

port for the monitoring and evaluation component, dissemination, support for some Secretariat personnel and data collection staff. The pMTCT Secretariat supports the day-to-day operations of the pMTCT-WG and coordinates activities of all six pilot service delivery sites in three districts, established to test and refine the delivery of a comprehensive package of services. These pMTCT pilot sites, deliberately selected in both urban and rural facilities and in diverse geographic areas, are part of the national health facilities network, administered by local District Health Management Teams (DHMT) in collaboration with bilateral and multilateral partners. The DHMT provides all health workers, including counsellors, nurse/midwives and pharmacists, as well as health facilities and infrastructure.

### Methodology

A rapid assessment of the six National pMTCT pilot program sites in Zambia was undertaken as part of a global assessment of UN supported pilot pMTCT services, comprised of a desk review of 11 countries initially supported by the UN and a rapid assessment in three countries: Zambia, Rwanda and Honduras. The pMTCT Secretariat, with extensive participation of local organizations, carried out the assessment in all six pilot sites, with the technical and financial support of Horizons/Population Council. Five evaluation instruments were employed, using both qualitative and quantitative methods (provider questionnaire [46], FGD [6], service observations [254] and exit interviews) [163]), to examine and document progress, experience and lessons learned to date, and to identify key issues and challenges to scaling up of all components of the pMTCT program; to examine mechanisms of collaboration and coordi-



nation; and to contribute to the preparation of a global generic programming framework.

## Results

The pMTCT Secretariat offers 5 training and sensitisation programs, including an 8-day course to update health workers on exclusive breastfeeding and HIV infant feeding counselling, using the WHO modules. A total of 18 trainers of trainers and 96 health workers.

All HIV-negative mothers and untested women are counselled in EBF for the first six months. HIV-positive mothers make an informed choice between EBF for 4-6 months or ERF, i.e. infant formula, after discussing the advantages and disadvantages of the available options. HIV-positive who choose to feed their children with formula are taught how to do so correctly by health workers. They are also monitored to try to ensure that the formula is prepared properly and done under hygienic conditions. Formula is provided for 6-12 months. In some sites, mothers can practice preparation under supervision.

Providers demonstrated good knowledge of advantages and disadvantages of EBF for six months, EBF for three months, wet nursing, infant formula and expressed heat treated milk as the IF choice for HIV-positive mothers. They were not familiar with milk banks or home prepared modified animal milk. Providers saw their role as giving information, encouragement, support and assistance in making a decision about an IF option.

Most providers showed a bias towards infant formula as the preferred IF method for HIV-positive women. Of the 32 provid-

ers interviewed, 21 said that formula was the best option for HIV-positive women. Providers' opinions about EBF by HIV-positive women and optimal choice of IF method were unrelated to having received training on IF counselling, nor were there systematic differences among sites.

Providers frequently steer women towards an IF method based just on HIV status. Observations and exit interviews shed light on the provider-client dynamic. During 42 observations of IF counselling, providers almost always discussed the advantages and disadvantages of EBF for three to six months then abrupt cessation and formula. Expressed heat treated milk was mentioned in one-third of sessions, and wet nursing in five sessions. Most providers (41/42) made suggestions rather than commands about infant feeding.

Counsellors did not ascertain the clients' specific circumstances, necessary to helping women consider her ability to implement various feeding choices. Only 10/42 providers inquired whether the mother had money to buy formula and only 6/42 asked whether the client had access to adequate supplies of water and fuel. Just 7/42 asked whether the client had disclosed her HIV status to her partner, and 5/42 asked whether the client had disclosed her status to other family members or close friends. In 26/42 sessions, the providers adequately explored (and in 12 observations "somewhat" explored) the feasibility and acceptability of various feeding options.

Counsellors are seen as providing convincing, sound, comforting information about the optimal choice and are helping women feel that they have made a good decision. In the exit interviews, the majority of the

69 women who had received IF counselling indicated that the counsellors had explained just one option (infant formula feeding was the most popular option, followed by breastfeeding). Of the 69 respondents, 30 said that they had chosen formula feeding, while the rest had decided to breastfeed, with 11 opting to feed as per norm. Despite most women indicating that they did not receive more than one infant feeding choice, only 15/69 reported that they felt a particular option was being promoted.

EBF followed by cessation of breastfeeding and RF are contrary to community norms, according to community FGD results. Both options generate some level of derision that children are being fed inadequately. These discussions underscored the need for family, and particularly partner support, for a women to successfully manage infant formula.

The community felt that HIV-positive women should reveal their status and serve as peer counsellors, stating that HIV-positive women are preferred as a source of support for IF issues because they are like the other women in the pMTCT program rather than health providers, who are old and long removed from their own experience with IF.

Reliable supply of infant formula and/or milk for babies is an issue for providers and community. This is seen by both groups as important to maintaining the credibility of the program.

## Conclusions and recommendations of authors

As a result of various donors attracted by pMTCFT-Working Group, program inputs

and staff costs are currently met. The concern now is whether these donors can provide support for all of the country and what other sources of support can be secured for program expansion.

Specific infant feeding related conclusions include: 1) providers demonstrated a bias towards infant formula as the IF method for HIV-positive women; 2) provision of infant formula by the pMTCT program is highly valued by the community; and 3) safety of the use of infant formula in these communities is unknown.

As part of the planning for replication and scale up of the pMTCT program, several IF-related recommendations emerged, including: 1) Safety data should be collected and combined with the information provided by providers and the community about the role of formula in preventing MTCT; 2) These data, in combination with new data on feeding patterns and link with MTCT which will be available in 2003, should guide the program in updating training materials and recommendations regarding infant feed-

ing counselling and support; and 3) If the pMTCT program takes the decision to no longer provide free formula, the impact on program acceptability and uptake needs to be considered.

### **Methodological considerations/ reviewer's comment**

This rapid assessment appears to have been extremely well organized, generating a great deal of valuable information using five structured instruments appropriate for the collection of relevant quantitative and qualitative data concerning pMTCT operational issues, health care providers, clients and communities. The results are presented systematically, organized by key issues in a way that is useful to the reader. Information collected on infant feeding provides very useful insights and should help program planners improve training and counselling related to infant feeding options and anticipate potential problems related to scaling up, including the supply of formula when the program is expanded.

# ZIMBABWE

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## Infant Feeding, which way? Zimbabwe (Chitsike, 2000)

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### Document title

Infant feeding, which way?

**Authors** Chitsike I

### Institution

AIDS and TB Unit, MoH Zimbabwe

**Date** Undated, perhaps 2000

**Country** Zimbabwe

### Document type

PowerPoint presentation

**Source** ESARO CD

## Background

HIV seroprevalence in pregnant women in Zimbabwe in 2000 was 35% (10–70%) as compared to 29% in 1997. There is a 10.5% seroconversion in HIV negative pregnant women by the end of the second year post-partum. There are 50–60 thousand babies infected with HIV annually, and 98% are breastfeeding at one year. While policy recommends exclusive breastfeeding (EBF) for 6 months, EBF at 3 months is 16%.

Prevention of MTCT pilot projects were at 3 urban clinics (10,000 ANC/year) in Harare, Chitungwiza and Bulawayo. Core interventions were VCT, safe obstetric practices, short course AZT, and infant feeding counselling. A survey was conducted (*methodology not stated in the PowerPoint print-out*) of 188 HIV-positive mothers interviewed by counsellors in Zengeza and Chitungwiza, Zimbabwe.

## Results

Mean age of baby at interview seven months, ranging from under one month to 20 months; 35.7% reported having disclosed HIV-positive status to partner.

Knowledge of HIV transmission through breast milk: 88% of mothers knew there is a risk of transmission through breast milk. Asked whether one can reduce BMT, 52% indicated no and 44% yes. To reduce BMT: 33% said to avoid giving BM; 36% said to boil BM; 18.5% said to use BM exclusively; 10% said they did not know; 1% said early cessation, and 1% said ARV drugs.

Infant feeding practices: Breastfeeding was cited by 84%, formula feeding by 16%, expressed BM by 5%, home-prepared milk by 1%. EBF was practised by 84% at one week; by 75% at one month; by 40% at 3 months; and by 0% at 6 months

Factors influencing mother's decision: 70% of these mothers felt it was their decision. If money were not an issue, 59% would prefer formula and 39% breastfeeding.

Cultural factors limiting breastfeeding included suspicion of HIV infection by 30%; stolen baby by 16%; immorality by 13%; witchcraft by 5%; others (medical reasons, work, etc.) were not quantified.

## Conclusions and recommendations of authors

1) Awareness of BM transmission was high;  
2) mothers can be decision makers with regard to breastfeeding; 3) barriers include economic factors, stigma and cultural beliefs.

Recommendations: 1) Work on making breastfeeding safe and 2) HIV-negative mothers require attention.

## Methodological consideration/ reviewer's comment

Weaknesses: The author concedes this to have been a hurried survey of feeding practice percentages of babies aged neonatal to 20 months. Conclusion that mothers can make their own decisions is important but shaky if based on one statement by the mothers.

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## Education and Counselling, ZVITAMBO (Tavengwa et al, 2002)

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### Document title

Education and counseling make a difference to infant feeding practices and those feeding practices make a difference to infant mortality

### Authors

Tavengwa N, Piwoz E, Gavin L, Zunguza C, Marinda E, Iliff P, Humphrey J, ZVITAMBO Study Group

### Institution

ZVITAMBO Project, University of Zimbabwe; Harare City Health Department, Zimbabwe

**Date** Sept 23–27, 2002

**Country** Zimbabwe

### Document type

Power point presentation at WABA Global Forum 2, Arusha, Tanzania

**Source** ZVITAMBO

## Background

This report is based on a placebo-controlled trial of postpartum vitamin A supplementation of 14,110 mother-baby pairs in urban and peri-urban settings.

## Methodology

Mothers were recruited within 96 hours of delivery with written informed consent. They were tested for HIV (parallel ELISAs, if positive confirmed on subsequent visit; if discordant, Western Blot). Mothers could choose to know status or not. Eligibility criteria required that neither mother nor baby was seriously ill, baby weighed at least 1500 g; and that they could be followed up at six weeks, three months and then every three months to one-to-two years.

Feeding practices were defined as follows: exclusive breastfeeding (EBF) was nothing except breast milk, medicines and vaccines; predominant breastfeeding (PBF) was breast milk and other non-milk-containing liquids; mixed feeding (MF) was breast milk plus other animal milk including commercial infant formula, with or without other liquids; and complementary feeding was breast milk and solid food with or without other liquids or other milk. Feeding practice category was defined by 1) 24-hour history, 2) seven-day history, 3) 'ever' (i.e., 'Have you ever given your baby anything other than breast milk?'), 4) 'conditional ever' (previous data points available and consistent).

Qualitative research consisted of focus group discussions (FGDs) and in-depth interviews (IDIs), new research findings (especially on exclusive breastfeeding and mastitis) and recommendations from UNAIDS (on empowerment of women to make informed decisions) and the Ministry of Health were used to develop an education and counselling intervention designed to assist mothers in reaching infant feeding decisions.

The intervention included 1) antenatal sensitisation, 2) male outreach, 3) integration of infant feeding counselling into HIV pre- and post-test counselling, 4) supportive counselling and 5) referral to other agencies as appropriate.

## Results

HIV seroprevalence was 33% ; 43% of the women were aged 25 to 34; incident HIV infection in baseline seronegative mothers was 4–5% per year; 94% of mothers were breastfeeding at 12 months and 63% were still breastfeeding at 18 months.

Comparison of pre- and post-intervention cohort showed an increase of condom use ('sometimes' or 'always') from 5.3% to 9.7%.

The rate of EBF at 3 months, defined by 24-hour history, was 17%, by 7-day recall was 12%, 'ever' was 5%, and 'conditional ever' was 4%.

The rate of EBF at 3 months ('conditional ever' definition) in the pre-intervention cohort was 2%; in the post-intervention (education but no individual counselling) it was 9%; and in post-intervention (with education and individual counselling) it was 19%.

Counselling: 73% of the mothers attended one session only, with a duration of 30 to 40 minutes.

The disclosure rate increased (pre- to post-intervention) for HIV-positive mothers from 52% to 64%, for HIV-negative mothers from 80% to 89% ( $p < 0.05$ ). Rate of EBF at 3 months ('conditional ever' definition) for mothers who did not disclose 5%, for mothers who disclosed to their husbands 9%, for those who disclosed to someone other than their husband 22%.

Unadjusted one-year mortality (per 1000) of babies of HIV-positive mothers, by feeding practice ('ever' definition) at three months: EBF 50, PBF 95, Comp 104, MMF 210. Hazard ratios (compared to EBF, adjusted for birth weight, maternal CD4 count at recruitment and maternal arm circumference): PBF 2.5 ( $p = 0.04$ ), Comp 2.8 ( $p = 0.02$ ), MMF 6.0 ( $p = 0.001$ ). Hazard ratios for babies of HIV-negative mothers: PBF 1.2, Comp 1.4, MMF 2.8 (not statistically significant).

## Conclusions and recommendations of authors

Authors concluded that: 1) the dilemma over breast or replacement feeding is difficult; 2) there is scope to substantially increase EBF rates; and 3) EBF is associated with lower mortality than mixed feeding. Transmission rates have not yet been reported but it is likely that the reduction in mortality associated with EBF is primarily due to a reduction in breastfeeding MTCT of HIV.

## Methodological considerations/ reviewer's comment

**Strengths:** This study offers a large sample size and followed HIV-positive and HIV-negative mothers.

**Weaknesses:** This was not a randomised trial of either infant feeding practice or the education and counselling intervention. To date, there is absence of HIV transmission data.

This study was not in the setting of a 'normal' pMTCT program. It is likely that the effect on infant feeding practices of a similar intervention, integrated into antenatal and perinatal care, would be even greater.

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## Feasibility of Heat-Treating Expressed Breast Milk (Israel-Ballard et al, 2001)

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### Document title

Zimbabwean Attitudes and Resource Accessibility as a Measure of the Feasibility and Acceptability of Heat Treating Expressed Breast-milk for Prevention of Mother to Child Transmission of HIV

### Authors

Israel-Ballard K; also Padian N, Chantry C, Chipato T, Chirenje Z, Morrison P, Chitibura L

### Institution

University of California; University of Zimbabwe Collaborative Women's Health Programme

### Date 2002

Country Zimbabwe

### Document type

MPH Thesis and Presentation (of same name) at 130th Annual Meeting of the American Public Health Association, November 10-13, 2002

### Source Author

## Background

In Zimbabwe, little attention has been paid to heat-treating expressed breast milk (HEBM) as an infant feeding choice for HIV-positive mothers, although it is officially listed as an option by the MoH. It is a good potential candidate as an effective, simple, inexpensive and sustainable method. The purpose of this study was to determine the likely feasibility of HEBM in different communities in Zimbabwe.

## Methodology

Thirteen focus group discussions (FGDs), with four-to-seven participants each (total 77), were held with four different target populations (women of child bearing age who were breastfeeding at the time or had previously breastfed a baby, grandmothers (over 45 years old), nurse midwives and traditional birth attendants (TBAs), husbands who had fathered a child in the last five years), in three different sites (Harare (upper socio-economic), Glenview a "high density" suburb of Harare (middle socio-economic), and rural (commercial farming estate). An extra FGD was held in "high density" Harare for women of child-bearing age who were members of an HIV support centre.

Informal discussions were first held with mothers who were expressing breast milk for their premature babies, followed by a pilot FGD with HIV-positive peer counselors in the high density suburb to develop the FGD Guide. The HIV status of participants was not asked or determined.

Ten out of thirteen FGDs (nine of which were in Shona, one mixed, three in English) were facilitated by a Zimbabwean research assistant and co-facilitated by the first author, the other three were the other way around. Written consent was obtained. FGDs were audio-taped, transcribed verbatim and translated. Questions addressed included: knowledge of HEBM for pMTCT or for other reasons, its practicality and acceptability, relevant cultural attitudes, and the support and educational and counselling inputs that would be required for it to be successful.



## Findings/Results

Age of participants: all mean of 42 years (18–65); mothers 32, fathers 41, midwives/TBAs 43, grandmothers 52. In Harare, 20 (91%) had had tertiary education, in the rural site, seven (20%) had had no formal education. Harare mothers had employment, most rural mothers and those in Glenview did not. Non-exclusive breastfeeding was the norm.

Knowledge: 1) Most FGD participants knew of breastfeeding transmission of HIV. 2) Most, including most midwives, did not know of HEBM. 3) All knew of manual expression of breast milk (usually taught by the mother's mother at the time of child-birth). The most common reason given for expression was the baby being unable to suckle (eg because of prematurity or sickness). Other reasons included feeding orphans, sore nipples, and the use of breast milk for various healing processes. Eighteen (30%) of the women had expressed at some time.

Practicality: 1) Expression of breast milk was thought to be painful, but only at first; proper education and the use of baseline were said to be important. Rural grandmothers and TBAs thought that HEBM should only be used in emergencies. Concerns expressed included diminished bonding, reduction in milk production and time constraints. Several said it could be as quick as breastfeeding (<15 minutes). 2) Heat treatment: "flash boiling" was considered preferable to pasteurisation because of being able to view the required heat point, and because it is more efficient in time and fuel. 3) Source of heat: electricity for Harare, firewood for the rural area, though could be paraffin. Nothing would have to be purchased specifically. 4) Using a cup was known to be safer than using a bottle. In

any case separate utensils are routinely used for infant feeding and these are normally cleaned with boiling water. 5) HEBM was considered affordable and therefore sustainable.

Cultural beliefs: 1) Not breastfeeding is considered to be an indicator of infidelity or other misdeeds, bewitchment or being pregnant again. Breastfeeding means the baby belongs to the entire family. 2) Rural participants thought that expressed breast milk might be used for witchcraft, is unclean, comparable to human meat, indicates the HIV status of the mother. Some thought it was very dangerous.

Family perceptions: If consulted, the husband would be supportive, if not he would question the mother's fidelity and perhaps divorce her. Fathers, mothers-in-law and perhaps other members of the family need to be involved and supportive. Some rural TBAs and fathers thought that HEBM would never be acceptable.

Education and counselling should be conducted by trained professionals or lay people. Rural participants wanted someone from outside the area because of concern that confidentiality would not be respected. Some participants from Harare felt strongly that information on all feeding options (including HEBM) should be given to all mothers, not just those found to be HIV-positive. Education was considered the key to acceptance.

## Conclusions and recommendations of authors

1) HEBM is an official feeding option in Zimbabwe but few know about it. It is an ethical right for an HIV-positive mother to be properly informed about it. 2) Con-

straints for HEBM are a) time, b) physical constraints around manual expression and milk production, c) lack of support from husband and family, and d) the influence of traditional beliefs. 3) Benefits are the availability of breast milk at no cost with its nutritional advantages but with protection against HIV transmission. 4) Participants from the (very superstitious) rural area, who were of low educational level were quite negative about HEBM but even they thought that education would make a big difference. In this area it would be difficult to attempt, especially because of the mistrust of health workers. 5) Dependence on the husband seemed to be inversely proportional to the likelihood of success with the method. 6) HEBM may be more suited as an alternative to formula feeding (rather than to breastfeeding). 7) Resources (including breast pumps) were not the perceived problem, rather the attitudes of family and community. 8) Information is needed on a) denaturation of breast-milk constituents with flash boiling, and b) contamination of HEBM under different storage conditions.

## Methodological considerations/ reviewers comment

This was a carefully conducted small study, with appropriate preparation and safeguards.

The study did not pretend to and did not test the feasibility or sustainability of HEBM as an infant feeding option but found a high degree of willingness to consider the possibility. None of the participants had expressed breast milk over a period of several months. The statement that, as an ethical imperative, it should be always included when pMTCT issues are presented should be seriously considered.

## MULTI-COUNTRY REPORTS

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### Status of Protection, Support and Promotion of BF (Latham and Kisanga, 2001)

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#### Document title

Current status of protection, support and promotion of breastfeeding in four African countries: Actions to protect, support and promote breastfeeding in Botswana, Kenya, Namibia, and Uganda

**Authors** Latham MC, Kisanga P

**Institution** UNICEF ESARO

**Date** January 2001

#### Countries

Botswana, Kenya, Namibia, Uganda

#### Document type

Report for UNICEF ESARO

**Source** UNICEF ESARO CD

### Background

Government and UN agencies have been reducing their support for breastfeeding in sub-Saharan Africa. This study was commissioned by the UNICEF Eastern and Southern Africa Regional Office to determine the extent of reduction in four countries.

### Methodology

Data and other information for this study were derived from 1) interviews with key informants and organisations, including a Minister of Health, Members of Parliament, senior officials in various Ministries (including Health), NGO leaders, UNICEF representatives and program officers, WHO staff (though no specifics of these interviews, numbers, etc. are given in the report) in four countries: Kenya [K], Namibia [N], Botswana [B] and Uganda [U] and 2) observations and reviews of actions to sup-

port breastfeeding in the previous two-to-three years (though how these observations and reviews were done is not explained in the report).

### Results

A major decline has occurred in support of breastfeeding and consists of a) decreased support by UNICEF, b) weakened Nutrition Units in MoHs, c) BFHI action has almost stopped, d) little action/monitoring/enforcement of the 'Code' in B, N and U, although there is some new interest in K, e) World Breastfeeding Week is still held but with markedly reduced support, and f) breastfeeding NGOs are dead or dying, for reasons including diminished support from governments and UN agencies.

Breastfeeding is still the cultural norm, although rates of exclusive breastfeeding (EBF) at three and six months are very low.

The decrease in support for breastfeeding (there is no evidence for a decline in breastfeeding itself) is related to HIV/AIDS. Concern about HIV has led to a) less activity in support of breastfeeding and b) the belief that 'all mothers will infect their children through breastfeeding'. At the same time there is a) inadequate recognition (by all, including professionals and lay people) of the dangers of formula feeding and b) inadequate knowledge of the Durban study (showing lower transmission of HIV to EBF babies than to those mixed fed).

Policies on HIV/AIDS and pMTCT have influenced promotion of breastfeeding in various ways in these countries:

Botswana had undertaken a major expansion of VCT, provision of free AZT in late pregnancy for those choosing formula feeding (FF), plus 'choice' of feeding

method. The authors believe that the presentation of this 'choice' is biased by a) health workers believing that there is 100% HIV transmission through breastfeeding and being ignorant of the benefits of EBF and the risks of not breastfeeding and b) the economic advantage of free FF. Other concerns are that providing free FF results in an increase in mixed feeding and that AZT is shared with other family members. At the time of the Latham/Kisanga report, there had been no independent evaluation of the Botswana pMTCT program; since then see Willumsen and Rollins, 2001, summarised here under 'Botswana'.

Kenya had very disparate policies and actions. While high-level government statements have urged all HIV-positive mothers not to breastfeed, many health workers are advocating breastfeeding 'as usual' until more evidence is available. All evidence gathering relates to HIV transmission rates, not morbidity (including malnutrition), mortality, family economics, fertility, or exclusivity of feeding practice. There is (was) no national pMTCT policy, and the authors are concerned about the balance (bias) of the membership of committees advising the government on the development of policy.

Namibia: The government currently advises 1) no change in the policy of promotion and support for breastfeeding and 2) increased investment in family planning and control of STIs. (This policy clearly finds favour with the authors.)

Uganda has a history of energetic advocacy for prevention. Advice on alternative feeding practices is well articulated in draft pMTCT policy, advocating either 1) EBF for three months (authors have recommended this be changed to six months), 2) FF from birth, or 3) animal milk from birth.

## Conclusions and recommendations of authors

The authors' comments on the approach of the four countries to MTCT through breastfeeding highlight the following: 1) family planning (to prevent conception of potentially HIV-infected babies) was not a high priority (except Uganda); 2) confusion caused by the linkage of intra-uterine/-partum transmission and breastfeeding transmission is expressed as 'babies will only benefit from the ARV research study reductions in MTCT if they do not breastfeed'; 3) a compromise is tacitly developing between advocates of exclusive FF from birth and of 'normal' breastfeeding, i.e., short duration breastfeeding with abrupt cessation; 4) health workers and the general public lack knowledge of the relative risks of breastfeeding and alternative feeding, expressed as an exaggeration of the risks of breastfeeding transmission and minimising the risks of FF; and 5) an urgent need for research into alternate feeding methods. The authors worry about potential resultant malnutrition and the absence of consideration of what to feed babies after either EBF or exclusive FF.

The authors recommend the following: 1) UNICEF, WHO, governments and NGOs should increase support of breastfeeding; 2) strengthen Nutrition Units; 3) create national breastfeeding coordinating committees; 4) legislate, implement and monitor the 'Code'; 5) increase support for the BFHI, World Breastfeeding Week and breastfeeding associations and NGOs; 6) promote EBF for 6 months; 7) submit pMTCT activities to independent evaluation; 8) train VCT counsellors in infant feeding; and 9) UNICEF should appoint at least one nutrition program officer in each country. They conclude that 'going to scale' with FF is currently insupportable.

## Methodological considerations/ reviewer's comment

A blurring of the distinctions between data, interpretation of data, and recommendations makes assessment of this report difficult. The overall conclusions are, however, clear: that breastfeeding action has been markedly reduced and that there is an absence of coherent evidence-based policy on infant feeding. Some of the information presented is now outdated (at least for Botswana).

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## Prevention of MTCT in Asia (Preble and Piwoz, 2002)

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### Document

Prevention of Mother-to-Child Transmission of HIV in Asia: Practical Guidance for Programs

**Authors** Preble AE, Piwoz EG

### Institution

Academy for Educational Development, Washington, DC

**Date** June 2002

### Country

Cambodia, China, India, Myanmar, Thailand

**Document type** Report

**Source** LINKAGES Project

## Background

Many countries in Asia are experiencing a dramatic rise in both adult and pediatric AIDS. To date, there exists little documented experience related to the implementation of programs to prevent transmission. Two notable exceptions, Thailand and Cambodia, have taken deliberate actions to reverse the trend. This review focuses on five core interventions to prevent maternal to child transmission (pMTCT) of HIV, one of which is specifically related to infant feeding. Necessary medical care and social support for mothers and infants living with HIV/AIDS are also discussed. Annexes provide data on HIV/AIDS, infant feeding, and women's health for all Asian countries; the bibliography is extensive.

## Methodology

This systematic and well-written review compiles existing published and unpublished data and other information related

to the five countries most seriously affected by HIV/AIDS in the region: Cambodia, China, India, Myanmar, and Thailand. It also reviews the technical dimensions of MTCT of HIV in Asia, characterized by highly diverse epidemiological patterns within and among countries. Given the lack of program experience specific to the region, the authors draw on considerable experience and lessons learned from Africa and elsewhere in outlining core interventions to reduce transmission: 1) comprehensive maternal and child health services, 2) voluntary counselling and testing (VCT), 3) antiretroviral (ARV) prophylaxis, 4) counselling and support for safe infant feeding, and 5) optimal obstetric practice.

## Results

General findings of relevance to pMTCT programming, with direct or indirect impact on counselling and support for safe infant feeding, include the following:

Need for public education and communication programmes: Various Asian studies show pregnant women have limited understanding of HIV and MTCT. Three Indian studies reveal serious misconceptions about transmission and prevention of HIV. Even in Thailand, which has had an aggressive public education program, pregnant women appear to lack sufficient knowledge of MTCT according to one report. In another nearly half of HIV-positive pregnant women who reported no casual sex partners perceived themselves at little or no risk of infection by their husbands.

Health worker attitudes: Several studies reveal major problems related to stigma and discrimination by health care workers to people living with HIV/AIDS. In south India, village nurses were unwilling to con-

duct vaginal deliveries on HIV-positive women. A 1997 study of Thai doctors found many were unwilling to perform vaginal exams (19%), vaginal deliveries (31%), or C-sections (39%) on HIV-positive women.

Voluntary counselling and testing: Data on demand for VCT by antenatal women in Asia are limited. Acceptance rates for VCT were high in pMTCT pilot projects in Thailand (93%) and Cambodia (85%), but a recent pMTCT site in Myanmar reported only about 30% acceptance. Several Asian sites (Cambodia, India, Thailand) provided HIV testing and VCT at the time of delivery to reach women who have not received antenatal care. Two studies in India (one urban, one rural) concluded that a rapid test in the delivery room can increase VCT uptake significantly.

Use of ARV for pMTCT: Several studies in Thailand demonstrated the feasibility, efficacy, and safety (for infants) of AZT for pMTCT. In India, an 11-centre study of AZT for pMTCT rated compliance as "good" in 54% of the women, "fair" in 45%, and "poor" in one percent. Varying doses and duration of AZT prophylaxis was part of the problem. Early small study results with NVP for pMTCT in China and India suggest it may be effective and affordable. (The successful introduction of ARVs has implications for post-delivery transmission of HIV and thus impacts future recommendations related to infant feeding.)

Promotion of exclusive breastfeeding/early cessation: Evidence suggests that where support for exclusive breastfeeding has been implemented properly, positive results (up to 70% exclusive breastfeeding for the first three to five months) have been achieved in the region. In many Asian cultures, weaning foods are introduced as early

as the first month of life by grandmothers. Early cessation conflicts directly with current infant feeding practices in many parts of Asia.

The replacement feeding option for HIV-positive mothers: Although replacement feeding is recommended when safe, acceptable, feasible, affordable, and sustainable, the problem in Asia is that the majority of women do not know their HIV status. Thailand has decided to advise all HIV-positive mothers not to breastfeed and to provide them with free formula for 12 months, but the increasing number of mothers who qualify and government budget cuts are making it difficult to sustain this policy. In India, a National AIDS Control Organization (NACO) feasibility study on AZT found that in infants of HIV-positive mothers, mortality was higher (but not statistically significant) among replacement-fed infants than among infants breastfed exclusively for two months.

## Country programs

**Thailand.** Thailand has taken MTCT seriously. Its extensive pilot project experience is well evaluated and has enabled scale-up with many pMTCT interventions. In 1998, a placebo-controlled clinical trial in the northeast introduced VCT in public antenatal services used a simplified ZDV regimen: 100,000 new antenatal clients were tested for HIV, about 1% were infected, acceptance of HIV testing and adherence to the ZDV regimen was high, and HIV transmission was reduced about 30% to about 10%. An earlier 1997 pilot study in six provinces in the north concluded that the simplified ZDV regimen reduced MTCT to eight percent.

**Cambodia.** In Cambodia, a national pMTCT policy was finalized in 2000, focused on improving the acceptability, accessibility, and quality of health services and information on reproductive health and HIV/AIDS/STIs. Due to very limited maternal care services, the government is studying a package of pMTCT services through antenatal, perinatal, and postpartum care. Three pilot sites are underway.

**India.** Several programs are being tested. An efficacy study of a pilot program that includes AZT for the mother and infant, C-section before membranes rupture, and no breast milk concluded that MTCT was reduced. An 11-center feasibility study of a package that included routine antenatal VCT, short-course AZT regimen, iron folic acid and vitamin A, infant feeding counseling, babies tested with PCR at 48 hours and 2 months, and an 18-month follow-up for babies reached 150,000 antenatal women: 79% were counselled, 77% tested, and 1.8% were HIV-positive, of which 22% received AZT. Problems included late antenatal coverage, low rate of institutional deliveries, maintaining confidentiality, social stigma, low rates of exclusive breastfeeding, and insufficient links to communities. Based on the NACO AZT feasibility study, the government developed a firm policy on IF practices for HIV-positive mothers: exclusive breastfeeding during the first four months of life, gradual weaning between four and six months, and termination of all breastfeeding by the end of the six months.

**Myanmar.** A pMTCT pilot program that includes strengthening primary prevention, introduction of VCT, NVP for HIV-positive pregnant women and babies, improved obstetric and postnatal care, counselling on infant feeding, and improved birth spacing was started in 2000 and is being systematically scaled up. The government intends to have 27 townships implementing MTCT prevention activities by 2005. A study of IF practices and feeding options for HIV-positive mothers was carried out in 2002. (See Myanmar.)

## Conclusions and recommendations of authors

The authors of this review conclude that Asian governments need to assess their situation with respect to MTCT, identifying the most feasible and appropriate package of pMTCT interventions given the resources available. The following comprehensive actions were recommended to meet the challenges: 1) Review the HIV/AIDS epidemiology in each setting. 2) Ensure support for primary prevention of HIV/AIDS through condom promotion and provision, behaviour change communication, prevention and treatment of STDs, policy reform, etc. 3) Ensure that safe, voluntary contraception is available to prevent unwanted pregnancies, especially in HIV-positive women. 4) Review existing maternal and child health services and infrastructure to prepare those services to enable them to add prevention of MTCT services. 5) Identify opportunities to support core MTCT interventions, including VCT, ARV, safe in-

fant feeding, and optimal obstetric practices. 6) Engage in discussions with all stakeholders and partners to develop national strategies for pMTCT and to assure adequate funding. 7) Support operational and clinical research in pMTCT, as necessary. 8) Link prevention activities with care and support activities for families and communities affected by HIV/AIDS. 9) Contribute toward the creation of an enabling environment for HIV prevention (including pMTCT). 10) Periodically review MTCT prevention packages for continuing relevance and appropriateness, given the rapid changes in behavioural, biological, and pharmaceutical developments.

## Methodological considerations/ reviewer's comments

Although there exists little concrete programmatic experience in the Asian region to draw from, the authors successfully weave together additional relevant country evidence from other regions of the world to outline a systematic approach to the prevention of MTCT. This review underscores the need to address not only issues of infant feeding in order to reduce the transmission of HIV, but also MCH services, VCT, ARVs, and optimal obstetric practices. As such, this report presents a useful technical resource for policy makers and program planners interested in developing a comprehensive pMTCT package. The authors' conclusions and recommendations provide practical guidance and are relevant not only to the five focus countries, but also to other countries in the region.



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## Lessons Learned from HIV and MCH Studies (Rutenberg et al, 2002)

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### Document title

Integrating HIV prevention and care into Maternal and Child Health care settings: lessons learned from Horizons studies

### Authors

Rutenberg N, Kalibala S, Mwai C, Rosen J

### Institution

Population Council/HORIZONS Project

**Date** Feb 2002

**Country** Multiple

**Document type** Published Report

### Source

Population Council's Horizon Project

## Background

This report documents lessons learned from Horizons intervention studies that focus on the integration of HIV prevention and care into existing MCH settings, with a view to assisting in both the replication and scaling up of HIV programmes in the MCH setting.

A number of key areas are discussed in detail, including training to improve health worker performance, motivating health workers, supervision of HIV services and quality assurance of HIV testing, antenatal care for mothers, follow-up care for HIV-positive women, risk avoidance, VCT services, counselling on infant feeding, ARV to reduce MTCT and involving male partners. This summary will focus on those areas of direct relevance and impact to infant feeding practices.

## Methodology

The lessons from HORIZONS HIV projects were discussed at a three-day workshop of HORIZONS study investigators and service managers in Maasai Mara, Kenya, on July 23-25, 2001. The participants, who represented Horizons projects from Kenya, Tanzania, Uganda, Zambia, and Zimbabwe, presented overviews of their project objectives, activities (including AFASS), what worked, outcomes, and plans/recommendations for replication and scale-up. Notes from that meeting formed the first draft of this report.

That workshop was followed by a one-day meeting in Nairobi, Kenya, the following July 27 attended by the workshop participants plus representatives from the Kenyan government and several international development agencies. Horizons intervention studies were systematically reviewed to identify factors related to the successful integration of HIV prevention into MCH settings. The write-up from the workshop was made available and then edited by Horizons, resulting in the document reviewed here.

## Results

### (Summary of Lessons Learned)

#### Training to improve performance of health workers

- Conduct in-service training to increase number of trained staff and to train replacements.
- Provide job aids to prompt (e.g. prompt topics to be covered in ANC counselling sessions).
- Follow up and monitor trainees.
- Integrate pMTCT into pre-service medical and nursing curricula.

- Employ professional counsellors to support and mentor new counsellors.
- Help institutions to fully use the skills of trained health workers.
- Work with national medical bodies to also improve skills of private practitioners.

#### Motivating staff

- Emphasise that pMTCT is part of routine MCH.
- Involve senior staff to expand 'ownership'.
- Use supportive supervision to recognise and build on staff skills.
- Work with the Ministry of Health to reduce the root causes of poor motivation: working conditions, low pay, inadequate supplies, understaffing, etc.

#### Supervision of HIV-related services

- Standardise supervision by adapting and integrating the existing supervision checklist.
- Interact directly with mothers to supervise infant feeding (for example, exit interviews to assess what mothers discussed during counselling, supervision of mother preparing replacement feeds to ensure that information passed on fully).

#### Antenatal care for mothers

Effective pMTCT requires that all service providers be aware of a woman's HIV status and several programmes have had success with this approach. However, progress has been slow to integrate HIV education and counselling into routine antenatal care. pMTCT sites often share the same difficul-

ties as ANC: inadequate supplies and understaffing.

#### Follow-up care of HIV-positive women

Infants tend to be the focus of follow-up care, and women receive little or no proactive care after delivery. Many women who could discuss their HIV status within the antenatal care setting are reluctant to go elsewhere for psychosocial or medical support. Strategies to improve follow-up include:

- Develop a strategy for managing HIV in the same way as other chronic diseases.
- Change clinic procedures to provide incentives for follow-up.
- Refer women needing comprehensive HIV care to other health services and community groups that are accessible, affordable and acceptable.

#### VCT services

- Expand education activities outside the ANC clinic.
- Shift the counselling emphasis from pre-test to post-test support.
- Diversify sources of post-test support.

#### Counselling on infant feeding

Helping women make informed decisions on infant feeding (IF) also has an impact on the acceptability of other pMTCT components. Many women decline to use formula for fear it would disclose their status so there is no point in taking the ARV component of the pMTCT programme. Despite the increase in counselling on IF, many health workers still struggle to provide good information to mothers, especially with

regard to dealing with family members and others who question their use of formula. Misconceptions (and remaining confusion about EBF and transmission) hamper health worker ability to provide balanced information on feeding choices. However, training does appear to have contributed in helping health workers to counsel mothers to make informed decision, even in health provider environments accustomed to making decision for patients.

There is also some evidence that social class influences the decision to formula feed, with highly educated, independent women able to resist social pressure to breastfeed more effectively than poorer mothers. Poor mothers may also divert formula to other children, although this is difficult to monitor.

Rapid cessation of breastfeeding has been recommended in some projects: the Zambia EBF study recommends expressing breast milk from 2 months and offering it to baby by cup, another Zambian study recommends expressed breast milk from 5 months, followed by stopping breastfeeding and introducing formula for a few weeks at 6 months, followed by the introduction of other foods. (Note: This approach has not been evaluated and requires additional research to determine its feasibility, safety, etc.)

#### Practical strategies to improve IF Counseling

- Provide interim guidance on feeding, even though experts are still debating the best way to feed infants of HIV positive mothers.
- Expand and improve training.
- Document the challenging situations women face and how they handle them (case studies).

- Include planning for practising formula feeding as part of counselling (mixing, etc.).
- Promote proper infant feeding through IMCI.
- Encourage the transition from EBF to weaning by cup using expressed breast milk.
- Develop complementary foods using locally available ingredients.
- Involve men in infant feeding counselling.

#### ARVs

- Stress benefits of pMTCT for mother herself.
- Train TBAs to supervise use of ARV in labour and birth registration to monitor ARV use outside hospital.

### **Conclusions and recommendations of authors**

- Make HIV-related care the norm in MCH care.
- Strengthen ties between MCH and outside sources of care.
- Promote incremental, low-cost change.
- Work long-term to create a policy environment favourable to integration.

### **Methodological consideration/ reviewer's comment**

This report provides important insights related to the integration of HIV prevention in MCH settings. The findings and recommendations should be useful to policy makers and program planners responsible for the design and/or implementation of pMTCT programmes.

# HEAT TREATMENT OF MILK AND SAFE WATER

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## Lipolysis or Heat for HIV in Breast Milk (Chantry et al, 2000)

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### Document title

Effects of lipolysis or heat treatment on HIV-1 provirus in breastmilk

### Authors

Chantry CJ, Morrison P, Panchula J, Hillyer G, Zorilla C, Diaz C

### Institution

University of California, Davis, USA;  
University of Puerto Rico; Solano County  
Dept of Health and Social Services,  
California, USA

Date 2000

Country Puerto Rico

### Document type

Journal article *J AIDS* 2000, 24 (4): 325–29

Source UNICEF ESARO CD

## Background

Transmission of HIV through breast milk is associated with the presence of integrated viral DNA (provirus) in the mother's milk cells, although animal studies indicate that ingestion of a cell-free virus may be sufficient for transmission. The effect of maternal ARV therapy on breast milk HIV is unknown. Heat treatment (pasteurisation or boiling of breast milk) has been shown to inactivate infectivity. There is evidence that simply allowing breast milk to stand may enable lipase to release free fatty acids that may break down some viral envelopes. Lipolytic activity increases with milk storage, and may not be significant in fresh milk. There have been conflicting results as

to the HIV inactivation properties of breast milk. This study investigated the efficacy of heat-treating maternal milk or allowing breast milk to undergo lipolysis by standing for 6 hours at room temperature in the inactivation of HIV-1.

## Methodology

Four mothers receiving antenatal care in Puerto Rico were recruited. They were instructed to exclusively formula feed, but stimulate breast milk production by pumping several times a day. All were receiving combination ARV therapy at the time. Milk was collected twice weekly for three weeks postpartum. Colostrum defined as milk on day one-to-five, transitional milk day 6-to-14 and mature milk thereafter. Not all mothers completed sample collection. Milk HIV DNA and RNA were quantified by PCR in 1) fresh, 2) after standing for six hours at room temperature and 3) after reaching the boiling point.

## Results

Of the 17 breast-milk samples collected, 15 (88%) had detectable HIV DNA in the cellular fraction (HIV RNA undetectable in aqueous phase of all samples), even though all mothers had undetectable or low plasma viral load and mean CD4 count of 544 cells/ul.

Lipolysis by standing for six hours at room temperature did not destroy HIV in six of seven (83%) samples.

Bringing breast milk to the boil destroyed HIV in all breast milk samples (n=8)

## Conclusions and recommendations of authors

- Bringing breast milk to the boil does destroy HIV; this study did not investigate to what extent this also denatures other breast milk component.
- Standing breast milk at room temperature for six hours is inadequate for the destruction of HIV. Storage for more than 24 hours may be necessary, but is not thought to be bacteriologically safe without refrigeration facilities.
- HIV is still present in the breast milk of women on combination ARV therapy with low or undetectable plasma HIV viral load.

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## Water Safety for Infant Formula (Dunne et al, 2001)

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### Document title

Is drinking water in Abidjan, Cote d'Ivoire, safe for infant formula?

### Authors

Dunne EF, Angoran-B ni H, Kamelan-Tano A, Sibailly TS, Monga BB, Kouadio L, Roels TH, Wiktor SZ, Lackritz EM, Mintz ED, Luby S

### Institution

Centers for Disease Control, Project TETRO-CI (Abidjan)

### Date 2001

### Country Cote d'Ivoire

### Document type

Journal article *J AIDS* 2001 28 (4): 393–398

### Source Internet

## Background

While infant formula may be used to reduce the risk of MTCT, such use in developing countries is associated with higher rates of diarrhoeal morbidity and mortality. Some cases of diarrhoea are caused by formula prepared with contaminated water. The high nutrient content and low acidity of formula make it an ideal medium for bacterial growth. In Koumassi, Cote d'Ivoire, municipal water is treated with chlorine. Chlorine's protection, however, can be lost over time through evaporation. Evaporation can be reduced by using a tight-fitting lid. High levels of coliform bacteria indicate reduced chlorine but these bacteria are harmless. *Escherichia coli* (*E. coli*) faecal contaminants are associated with diarrhoea.

## Methodology

Koumassi district consists mostly of households of lower socio-economic status. The study evaluated the quality of water used to prepare infant formula and household knowledge, attitudes and practices regarding water and infant formula. Data collectors visited 120 randomly selected households in 9 neighbourhoods where mothers attended the HIV clinic. Household surveys were conducted over 8 weeks in April to June, a dry season, in 1999. Information was collected using a field-tested questionnaire and observations. Samples of water used to give the youngest child drinks and samples of the (home-based) source of that water were taken and tested for *E. coli* and coliform bacteria.

## Results

Access to safe water: Most people had access to and collected good quality, municipal water: 90% of water samples collected at in-home (44%) or community (56%) taps had adequate chlorine levels and no detectable coliform bacteria, better than most developing country systems.

Storage: Most (83%) of households stored drinking water because taps were far from home and/or unreliable. Stored water was considerably more likely to be contaminated that source water (74% versus 2%). In households with children under three, 41% had detectable *E. coli* in their stored water, failing WHO criteria for potability; 74% had coliform bacteria. Two samples of stored water had coliform and *E. coli* bacteria too numerous to count. Both *E. coli* and coliform were higher in water stored longer than 12 hours when compared to water stored less than 12 hours. Using a cup to remove water from the

source rather than pouring resulted in higher levels of coliform.

Feeding practices: Some caretakers gave infants drinking water during the first week of life and most did so by one month of age. The youngest child was drinking water in 74% of households. Only three of 97 women who described giving stored water to their youngest child treated this drinking water; all three used boiling. Only 10% of caregivers were formula feeding at the time of the study, but none of them boiled the water used to make the formula. Caretakers said it took 3-to-30 minutes to prepare a bottle of formula and that the bottle would be given within two hours of preparation. The average weaning age was 18 months, ranging from 2-to-36 months. The report does not indicate breastfeeding (BF) rates but details water use.

Feeding beliefs: Virtually all (98%) caregivers believed BG was best, and 52% expressed concerns about formula, including risk of diarrhoea, need for meticulous preparation and decreased nutritional value.

## Conclusions and recommendations of authors

This study is important because in communities where water is treated, health care providers may be assuming that household water is safe when they counsel mothers to formula feed. For mothers who choose FF in such communities, counsellors should urge mothers to store water in air-tight containers and not to store formula without refrigeration.

Where chlorination of municipal supplies is adequate, safe water storage is needed. One option is for mothers to routinely boil

water before use, but this is time consuming, costly and bad for the environment. The combined use of a safe water storage container to prevent recontamination and point-of-use chlorination with low-cost sodium hypochlorite solution may be a sustainable solution. Air-tight storage may be all that is necessary: women in Koumassi had paid on average US\$ 2 for their storage containers; the authors identify a container being made and sold in South Africa for US\$ 2.30.

## Methodological considerations

**Weakness:** The authors note study limitations, including the facts that findings may not be generalisable outside Koumassi and that water quality may vary from dry season to wet.

**Strength:** The study appears to be carefully conducted, providing a lot of detail on feeding practices and beliefs, as well as methodology. Background information and other developing country studies are well summarised with references to 30 related works.

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## Pretoria Pasteurisation Bacterial Contamination (Jeffery et al, 2002a)

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### Document title

Final Report: the effect of Pretoria Pasteurisation on bacterial contamination of hand-expressed human breastmilk

### Authors

Jeffery BS, Soma-Pillay P, Makin J, Moolman G

### Institution

MRC South Africa; University of Pretoria

**Date** August 2002

**Country** South Africa

### Document type

Report (for UNICEF, South Africa)

**Source** UNICEF

## Background

Pretoria Pasteurisation is a simple, low-cost method, devised for domestic use in poor settings, which has been shown to inactivate HIV in breast milk. The method uses passive transfer of heat from 450 ml of water heated to boiling point in an aluminium pot, into which breast milk (50–100 ml) is placed in a glass jar. Milk temperatures of 56–62.5 degrees Celsius are maintained for approximately 15 minutes.

Studies have shown that expressed breast milk (EBM) is subject to bacterial contamination with commensal or pathogenic bacteria. Heat treatment of expressed breast milk may reduce bacterial contamination and prolong storage time. This study sought to determine 1) whether Pretoria pasteurisation of expressed breast milk eliminates commensal and pathogenic bacteria and 2) the length of time pasteurised EBM can be stored at room temperature

without developing unsafe levels of bacteria.

## Methodology

EBM samples (n = 58) were obtained from women in the postnatal ward at a secondary hospital in Pretoria; each sample was split into control and pasteurised portions. The samples were kept in sterile containers and handled only with sterile gloves. All samples were tested 4 times at 4-hour intervals (baseline and after 4, 8 and 12 hours) to assess bacterial contamination. Contamination is measured in semi-quantitative colony forming units (CFUs); a count was deemed to be clinically significant if it contained 100,000 CFU/ml or more of commensal bacteria or 1000 CFU/ml of a known pathogen.

## Results

Out of the 58 pairs of samples, four of the pasteurised samples had clinically significant bacterial growth (6.8%), while 34 control samples (59%) had such growth, at baseline. At 12 hours, 53 pasteurised samples remained sterile compared to five of the controls.

Bacterial growth was rapid, with 28 out of 38 contaminated samples having clinically significant growth by four hours. The growth of pathogens was faster than that for commensal organisms. In 10 cases the growth of commensal organisms dropped after baseline sampling. Rapid growth of bacteria occurred in pasteurised samples, indicating that the bacteriostatic property of breast milk was reduced, compared with unprocessed EBM.

Pasteurised samples contained different organisms than the control samples did,



suggesting that they had not survived the pasteurisation but instead had been introduced afterwards (same pathogens in each and all in a batch, indicating lapse in technique).

## Conclusions and recommendations of authors

- Hygiene is important: Women should be reminded to wash hands before expressing.
- Bacterial contamination of unprocessed EBM occurred by 4 hours at room temperature, casting doubt that EBM may be safely stored for eight hours without refrigeration.
- Pretoria pasteurisation effectively destroys bacteria in EBM samples and keeps breast milk safe for 12 hours, IF it is kept sealed and not handled. Once bacteria have been introduced after pasteurisation, the reduced bacteriostatic activity results in rapid pathogen growth.
- Because of the potential for bacterial contamination after pasteurisation, milk that is to be stored after Pretoria Pasteurisation should not be handled after pasteurisation. If too much milk is expressed for one feeding, the portion intended for storage should be pasteurised in a separate jar and kept sealed in that jar until use.

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## Pretoria Pasteurisation and Viral Loads (Jeffery et al, 2002b)

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### Document title

Interim Report: Viral loads in the milk of lactating HIV infected mothers

**Authors** Jeffery BS, Webber L, Makin J

### Institution

MRC South Africa; University of Pretoria

**Date** October 2002

**Country** South Africa

### Document type

Report (for UNICEF, South Africa)

**Source** UNICEF

## Background

Pretoria Pasteurisation is a simple, low-cost method, devised for domestic use in poor settings, which has been shown to inactivate HIV in breast milk. The method uses passive transfer of heat from 450ml of water heated to boiling point in an aluminium pot, into which breast milk (50–100ml) is placed in a glass jar. Milk temperatures of 56–62.5 degrees Celsius are maintained for approximately 15 minutes.

As part of a study on the effectiveness of Pretoria Pasteurisation, breast milk viral loads were measured.

## Methodology

EBM samples (30–50ml) were obtained from 30 women in the postnatal ward at Kalafong Hospital and again two weeks later. Plasma viral load was also measured at the time of first breast milk. HIV viral load was determined by NASBA methodology (not clear what this is) and branched DNA methodology.

## Results

No significant drop in viral load between colostrums and mature milk (7509 +/- 2333 copies/ml versus 1280 +/- 2983 copies/ml).

In 4 samples, breast milk viral load was higher than plasma and a moderate correlation was found between plasma and breast milk viral load.

Women who had difficulties expressing at follow-up had breast milk with very high viral load.

## Conclusions and recommendations of author

Viral load was lower than previously found (possibly due to time to sample processing, which was longer and could have resulted in reduction of detectable viral load) but similar to studies by other groups.

No significant drop in viral load between colostrums and mature milk, although the authors caution that this could be due to difficulties in expression in some women at follow-up.

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## Pretoria Pasteurisation and Mothers' Attitudes (Pullen et al, 2002)

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### Document title

Final Report: attitudes of HIV infected mothers towards expressed and pasteurised breast-milk for infant feeding

### Authors

Pullen AE, Mokhondo KR, Jeffery BS

### Institution

MRC South Africa; University of Pretoria

**Date** August 2002

**Country** South Africa

### Document type

Report (for UNICEF, South Africa)

**Source** UNICEF

## Background

Pretoria Pasteurisation is a simple, low-cost method, devised for domestic use in poor settings, which has been shown to inactivate HIV in breast milk. The method uses passive transfer of heat from 450 ml of water heated to boiling point in an aluminium pot, into which breast milk (50–100ml) is placed in a glass jar. Milk temperatures of 56–62.5 degrees Celsius are maintained for approximately 15 minutes.

Many social and economic factors prevent HIV-positive mothers from having access to or making use of formula feeds. As the Pretoria Pasteurisation method does not require large economic outlay and preserves the protective factors in breast milk, it may be a suitable alternative to formula feeding by HIV positive mothers.

Infants in the neonatal intensive or high care units, who are often low birth weight, are susceptible to a number of nosocomial infections and benefit from breast-milk feeding. The Kalfong Hospital encourages HIV testing of preterm infants and provides counselling on infant feeding options. These infants would benefit from receiving pasteurised mother's milk, with HIV inactivated and the protective properties maintained.

## Methodology

Structured open-ended questionnaires were administered to 10 women recruited after delivery, including mothers of high-risk low birth weight infants. Information on the Pretoria Pasteurisation method was provided before obtaining consent.

## Results

Women were mostly dependent on family for housing and half lived in informal housing. Only 20% of women had their own residence and an average of 4.4 people shared each home. All women had access to tap water and 90% had electricity.

Women did not see themselves as primary decision makers and indicated that parents or sister of partner were decision maker, depending on who they stayed with.

All mothers interviewed were positive about the Pretoria Pasteurisation method and felt that they could use the method at home as well as in the hospital (simple method and equipment readily available at home).

Five of 10 requested immediate assistance in pasteurising their milk to feed their infant, due to lack of financial resources and safe facilities for formula feeding.

Two mothers expressed fears (unable to produce enough milk and disclosure of HIV status). Only half the women had disclosed their status, and one had been abandoned by her husband as a result. Other women were unsure about disclosure, for fear of breaks in confidentiality and abandonment.

## Conclusions and recommendations of author

- Due to their social and economic vulnerability and disempowerment, these mothers did not have the means to practice alternatives to breastfeeding.
- Traditionally breastfeeding is accepted and expected.
- Women did not foresee any problems with pasteurisation and some requested immediate help to establish this method of feeding their infant.
- Concerns regarding disclosure of status require further investigation to determine whether this method would be feasible in the domestic setting.

Although this study provides some interesting information, it is difficult to draw conclusions as to the acceptability of this method outside the hospital and to assess whether women's positive response to the method was not as a result of being interviewed by those who were recommending it.

# ENDNOTES

- <sup>1</sup> UNAIDS. HIV and Infant Feeding: A policy statement developed collaboratively by UNAIDS, UNICEF and WHO, 1997. [www.unaids.org/publications/documents/mtct/sitanag.pdf](http://www.unaids.org/publications/documents/mtct/sitanag.pdf).
- <sup>2</sup> The term mother-to-child transmission (MTCT) is used in this document (and the updated United Nations guidelines on HIV and infant feeding), although the more technical term for this phenomenon is vertical transmission. Other terms, such as parent-to-child-transmission (PTCT), have been proposed but not generally adopted. Other methods of transmission that are seldom mentioned and little studied are rape or sexual violence against children and medical transmission via non-sterilised needles and equipment.
- <sup>3</sup> De Cock KM, Fowler MG, Mercier E, et al. Prevention of mother-to-child HIV transmission in resource poor countries –Translating research into policy and practice. *JAMA* 2000; 283:1175-82.
- <sup>4</sup> Coutsooudis A, Pillay K, Kuhn L, et al. Method of feeding and transmission of HIV-1 from mothers to children by 15 months of age: Prospective cohort study from Durban, South Africa. *AIDS* 2001; 15(3):379-87.
- <sup>5</sup> Given current rates of MTCT, one would expect 7 in 100 infants born to HIV-positive mothers (receiving no intervention) to be infected with HIV in utero, another 15 to become infected during labour and delivery, and another 15 to become infected with HIV over the course of about two years of breastfeeding. This would leave 63 infants uninfected, despite being breastfed (De Cock et al cited above).
- <sup>6</sup> Dunn DT, Newell ML, Ades AE, et al. Risk of human immunodeficiency virus type 1 transmission through breastfeeding. *Lancet* 1992; 340:585-8.
- <sup>7</sup> Piwoz E, Huffman S, Lusk D, Zehner E, and O'Gara C. *Issues, Risks, and Challenges of Early Breastfeeding Cessation to Reduce Postnatal Transmission of HIV in Africa*. Academy for Educational Development. Washington, DC. 2001.
- <sup>8</sup> Flores M and Filtreau S. Effect of lactation counseling on sub-clinical mastitis among Bangladeshi women. *Annals of Tropical Paediatrics* 2002; 22, 85-88.
- <sup>9</sup> United Nations. HIV and Infant Feeding Framework for Priority Action. 2003.
- <sup>10</sup> WHO. Global Strategy on Infant and Young Child Feeding. Geneva, 2003.
- <sup>11</sup> The full report of the WABA-UNICEF HIV and Infant Feeding Colloquium, held in Arusha, Tanzania, in September 2002, is available at [www.waba.org.my](http://www.waba.org.my).
- <sup>12</sup> WHO. "HIV and Infant Feeding: A Guide for Health-Care Managers and Supervisors." Geneva. 2003b and WHO. "HIV and Infant Feeding: Guidelines for Decision-Makers." Geneva. 2003c.
- <sup>13</sup> Bijlsma M. *Infant Feeding and HIV for Eastern and Southern Africa, 1999-2001*. UNICEF Eastern and Southern African Region (ESARO). (CD-ROM) October 2001.
- <sup>14</sup> These documents are available at [www.qaproject.org](http://www.qaproject.org).
- <sup>15</sup> Definitions presented within the synthesis are derived from the 2003 revised WHO, UNICEF, UNFPA and UNAIDS. *HIV and Infant Feeding: Guidelines for Decision-Makers* (Geneva. 2003), with the exception of several working definitions developed by the editors, including 'breast-milk feeding', 'early cessation of breastfeeding', and 'predominant breastfeeding'.
- <sup>16</sup> Author-date citations indicate sources included in this compilation.
- <sup>17</sup> 'Weaning' is a non-specific term sometimes referred to as the process of cessation of breastfeeding and sometimes to the process of cessation of all baby food (breast milk and substitutes) and initiation of family food. Both meanings are used on occasion here and in the summarised documents.
- <sup>18</sup> By the term "exclusive breastfeeding", caretakers meant no other milks, but water and over-the-counter medication would be permitted. There was widespread use of water and medication.

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