



HIV and Infant Feeding

An information booklet for policy and programme managers in India



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HIV and Infant Feeding

An information booklet for policy and programme managers in India

Dr. J.P. Dadhich
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Published by



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Preface

In late 1990s, National Institute of Public Cooperation and Child Development (NIPCCD), New Delhi invited me to talk on “Breastfeeding and HIV”, perhaps the first ever such meeting in the country. The same day I saw a newspaper headline “Breastfeeding causes AIDS” and took that press cutting to the meeting to alert technical people gathered there. That was the crux of my speech to go forward with caution that breastfeeding practice does not get threatened.

The fact that HIV can pass through breastfeeding scared away the scientific community and also gave an opportunity to infant formula industry to offer them as a solution. HIV and infant feeding is therefore more than a critical area to deal with when it comes to health systems. We also believed then that “breastfeeding movement” will suffer and so will action on breastfeeding.

Infant formula for babies born to HIV positive mothers was promoted as a solution by UN agencies in several countries in Africa only to withdraw this after many years, when detrimental results of formula feeding in child health came up. More babies were dying of formula feeding. It was argued and proven that breastfeeding was highly protective. Research showed that it was ‘mixed –feeding’ that leads to higher transmission than exclusive breastfeeding. Ongoing research and experience mostly from Africa led to what we now call “safe” exclusive breastfeeding. In this, anti-retroviral drugs are being provided to mother and baby as per the clinical status of the disease in the mother.

In 2010, the WHO guidelines were suitably revised to accommodate the role and importance of breastfeeding and provided criteria for replacement feeding as well as provision of ARVs. It was a turnaround in the way we deal with infant feeding in HIV positive women. NACO India has harmonized its national guidelines with new WHO guidelines.

I am sure this information booklet which is intended to reach programme managers and policy makers who deal with child health and HIV issues will be useful to understand various aspects of infant feeding in HIV exposed children. This booklet reviews the transmission process and risk factors associated with it. More importantly, it provides in a simple way what specific action is to be taken in different situations. It includes how to train health workers to enable them for providing skilled counselling and offer infant feeding options.

Infant feeding issues have not enjoyed so far a great deal of attention required especially in building skills of health workers. The booklet will add value to existing efforts to lead to HIV free child survival if implemented in its entirety.

Delhi
September 6, 2013

Dr. Arun Gupta
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Central Coordinator, BPNI

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Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ARV	Antiretroviral
ART	Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
NACO	National AIDS Control Organisation
NFHS	National Family Health Survey
ICTC	Integrated Counselling and Testing Centre
IMS Act	Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act 1992 and amendment Act 2003
IYCF	Infant and Young Child Feeding
PPTCT	Prevention of Parent to Child Transmission
PTCT	Parent to Child Transmission
STDs	Sexually Transmitted Diseases
UNICEF	United Nations Children's Fund
VCTC	Voluntary counselling and Testing Centers
WHO	World Health Organization

1 Introduction

This document is designed for the benefit of policy makers and programme managers engaged in providing services for prevention and treatment of HIV in infants. The purpose is to take stock of existing situation and a wholesome approach towards the issue of infant feeding options in reference to HIV. The fact that HIV can pass through breastfeeding and also that breastfeeding has life saving implications for infants and children, pose a dilemma to all, including mothers who are HIV positive, whether to choose breastfeeding for their baby or give replacement feeding.

This document is an attempt to provide updated information up to September 2013, on the infant feeding options in HIV. In the last decade, there has been a significant amount of new research evidence and programmatic experience on infant feeding, which has led to a major shift in feeding counselling to HIV positive mothers. The document also deals with available feeding options based on a mother's HIV status, and health status. Policy makers and programme managers, with the enhanced knowledge of the modes of transmission, factors affecting transmission, the feeding options available, and information about use of Antiretroviral Therapy/ Antiretroviral drugs can help having such policies and programmes in place that can ensure empowerment of women to choose best infant feeding options for their babies and create support system for practicing infant feeding accordingly.

Parents-to-child transmission of HIV is the primary way by which children become infected with HIV. In relation to special circumstances created by HIV/AIDS, five priority actions for national governments are proposed in the context of the Global Strategy for Infant and Young Child

Feeding in WHO Guidelines on HIV and Infant Feeding 2010.¹

1. Develop or revise (as appropriate) a comprehensive evidence-based national infant and young child feeding policy which includes HIV and infant feeding.
2. Promote and support appropriate infant and young child feeding practices, taking advantage of the opportunity of implementing the revised guidelines on HIV and infant feeding.
3. Provide adequate support to HIV positive women to enable them to successfully carry out the recommended infant feeding practice, including ensuring access to antiretroviral treatment or prophylaxis.
4. Develop and implement a communication strategy to promote appropriate feeding practices aimed at decision-makers, health workers, civil society, community workers, mothers and their families.
5. Implement and enforce the International Code of Marketing of Breastmilk Substitutes and subsequent relevant World Health Assembly resolutions (the Code).

This document may be used optimally, if it is incorporated as a sensitization tool in the Prevention of Parent to Child Transmission programme at State level. Also, this can be of great use to sensitize various cadres of non-medical administrative officers. The document provides information that is in conformity with the National Guidelines on Infant and Young Child Feeding² and Nutrition Guidelines for HIV-Exposed and infected children (0-14 years of age) from National Aids Control Organization.³

2 Background

Infant Feeding & Child Survival

The first two years of life provide a critical window of opportunity for ensuring children's appropriate growth and development through optimal feeding. The Bellagio Child Survival Study Group, constituted by Child Survival experts (*Lancet series on Child Survival, 2003*) provides sufficient grounds to believe that estimated under-five deaths can be prevented by 13% with a simple intervention like breastfeeding and additional 6% by appropriate complementary feeds.⁴ (Figure-1)

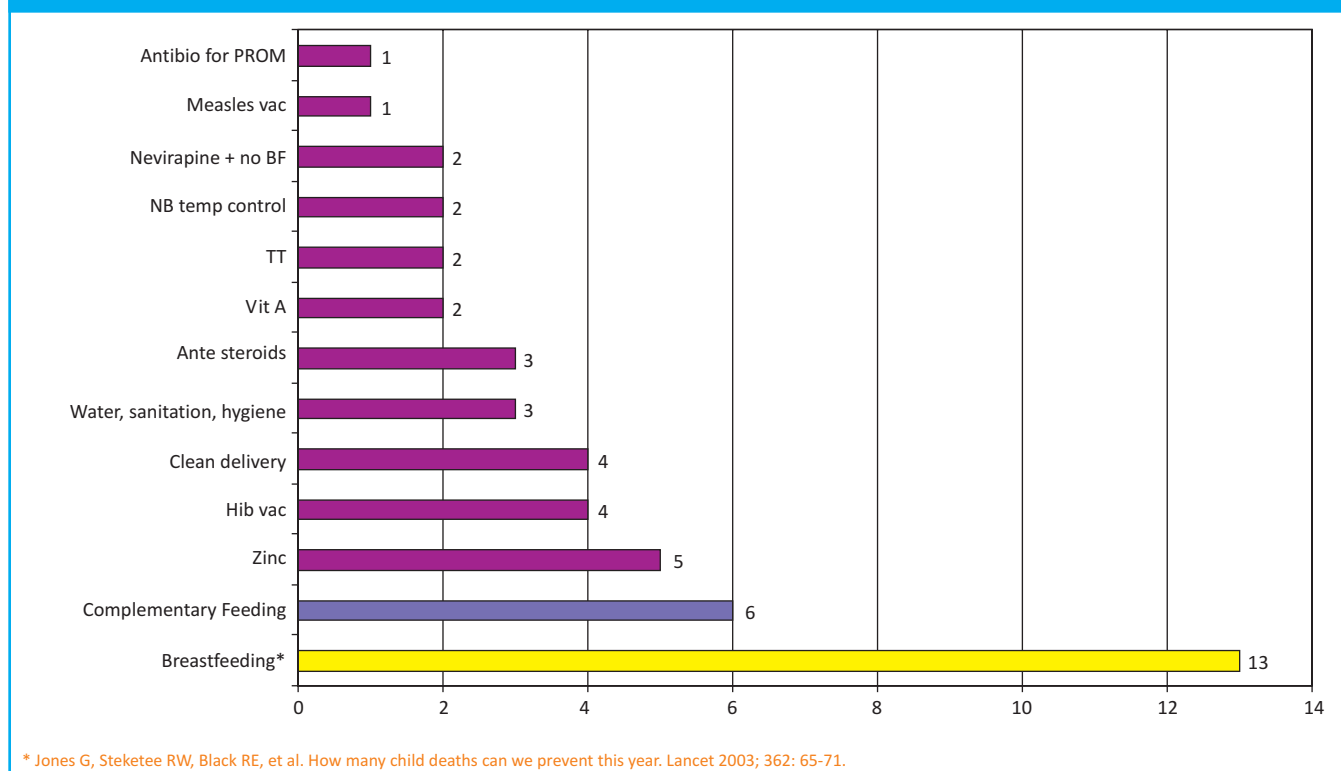
Diarrhoea and pneumonia are more common and more severe in children who are artificially fed and are responsible for many of these deaths. Diarrheal illness is more common in artificially fed infants even in situations with adequate hygiene. Other acute infections, including otitis media, *Haemophilus influenzae* meningitis and urinary tract infection, are less common and less severe in breastfed infants.⁵

Relevance of early initiation of breastfeeding to prevent neonatal mortality is well established and approximately 22% of all neonatal deaths could be prevented if in all women breastfeeding is initiated within one hour of birth.⁶ A WHO study of infant feeding patterns and risk of death and hospitalization in the first half of infancy, confirms that risk of death is 10 times higher in non breastfed infants and 2.5 times higher in partially breastfed infants.⁷

The preventive effect of exclusive breastfeeding on major childhood morbidities like diarrhoea and pneumonia and also on mortality due to these diseases has been amply highlighted in the recently published Lancet series on maternal and child undernutrition.⁸ The series concludes that:

1. The relative risk for all cause mortality was 1.48 and 2.85 for predominant (breastfeeding plus water) and partial breastfeeding as compared to exclusive breastfeeding.

Figure 1: Under 5 Child deaths (%) saved with preventive Interventions*



2. The relative risk of diarrhoea mortality was 2.28 and 4.62 and pneumonia mortality is 1.75 and 2.49 for predominant (breastfeeding plus water) and partial breastfeeding as compared to exclusive breastfeeding.

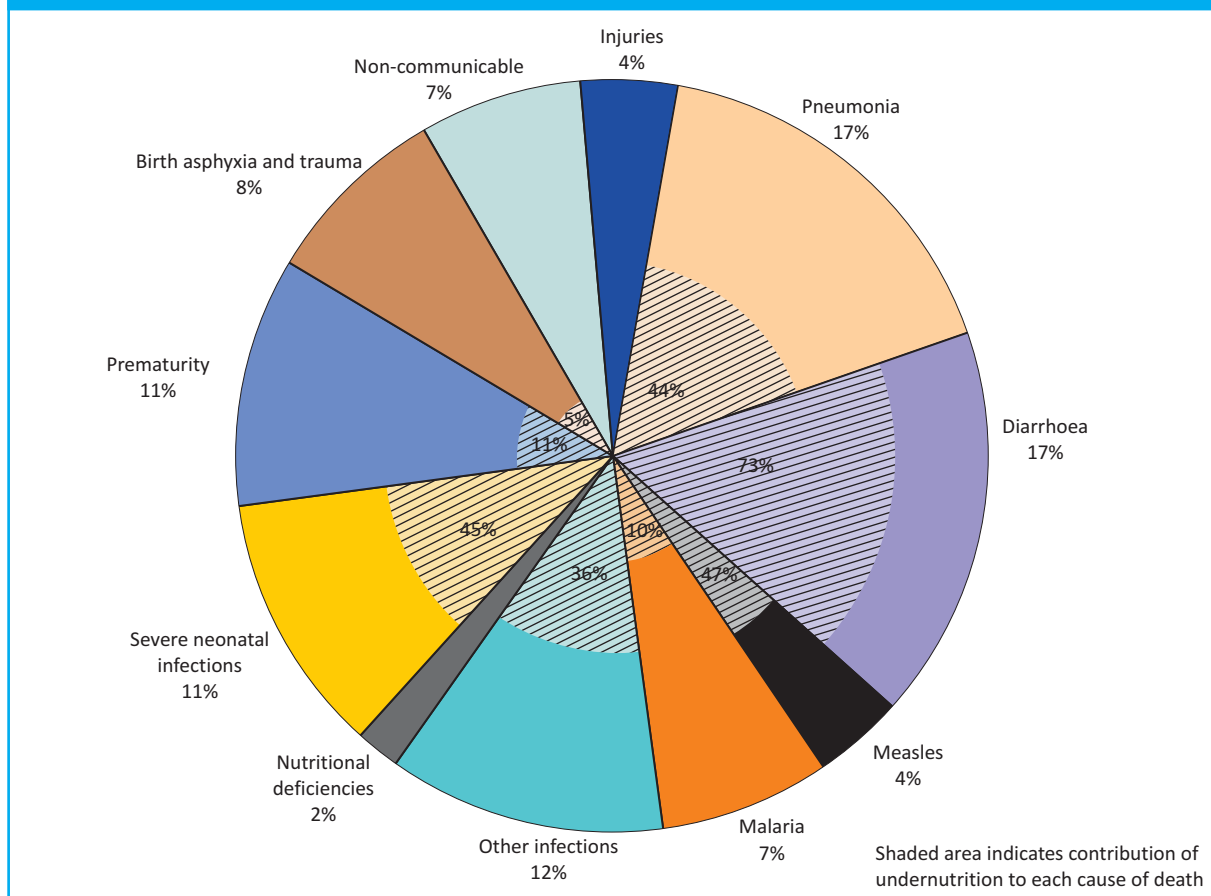
The relative risk for prevalence of diarrhoea was 1.26 and 1.68, while for pneumonia it was 1.79 and 2.48 for predominant (breastfeeding plus water) and partial breastfeeding respectively as compared to exclusive breastfeeding.

Adequate nutrition during *infancy and early childhood* is essential to ensure the growth, health and development of children to their full potential. Poor nutrition increases the risk of illness, and is responsible, directly or indirectly for one third of deaths that occur in children less than 5

years of age.⁹ (Figure 2)

As per the National Family Health Survey-III (2005-06), 48 per cent of the children under-five years of age are stunted and 43 per cent are underweight in India. The survey also establishes the fact that the proportion of children who are stunted or underweight increases rapidly with the child's age during 6-23 months. It may also be noted from the survey data that during the first six months of life, 20-30 percent of children are under-nourished as per three nutritional indices namely, stunting, wasting and underweight.¹⁰ The major reason for such poor nutritional status amongst children is inappropriate, inadequate and faulty infant and young child feeding practices.

Figure 2: Major causes of death in children under 5 years old with disease-specific contribution of undernutrition⁹

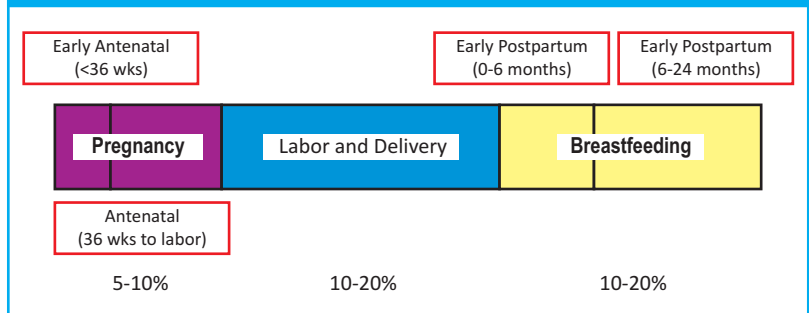


3 Transmission of HIV during Pregnancy, Labour and Breastfeeding

Transmission of HIV from mother to the child may occur during pregnancy, delivery or post-natal period through breastfeeding. In the absence of any interventions to prevent or reduce transmission, about 5-10 percent of HIV infected mothers pass the virus to their infants during pregnancy; between 10-20 percent during labor and delivery; and another 10-20 percent post-natal period through breastfeeding for entire period or up to 24 months.¹¹

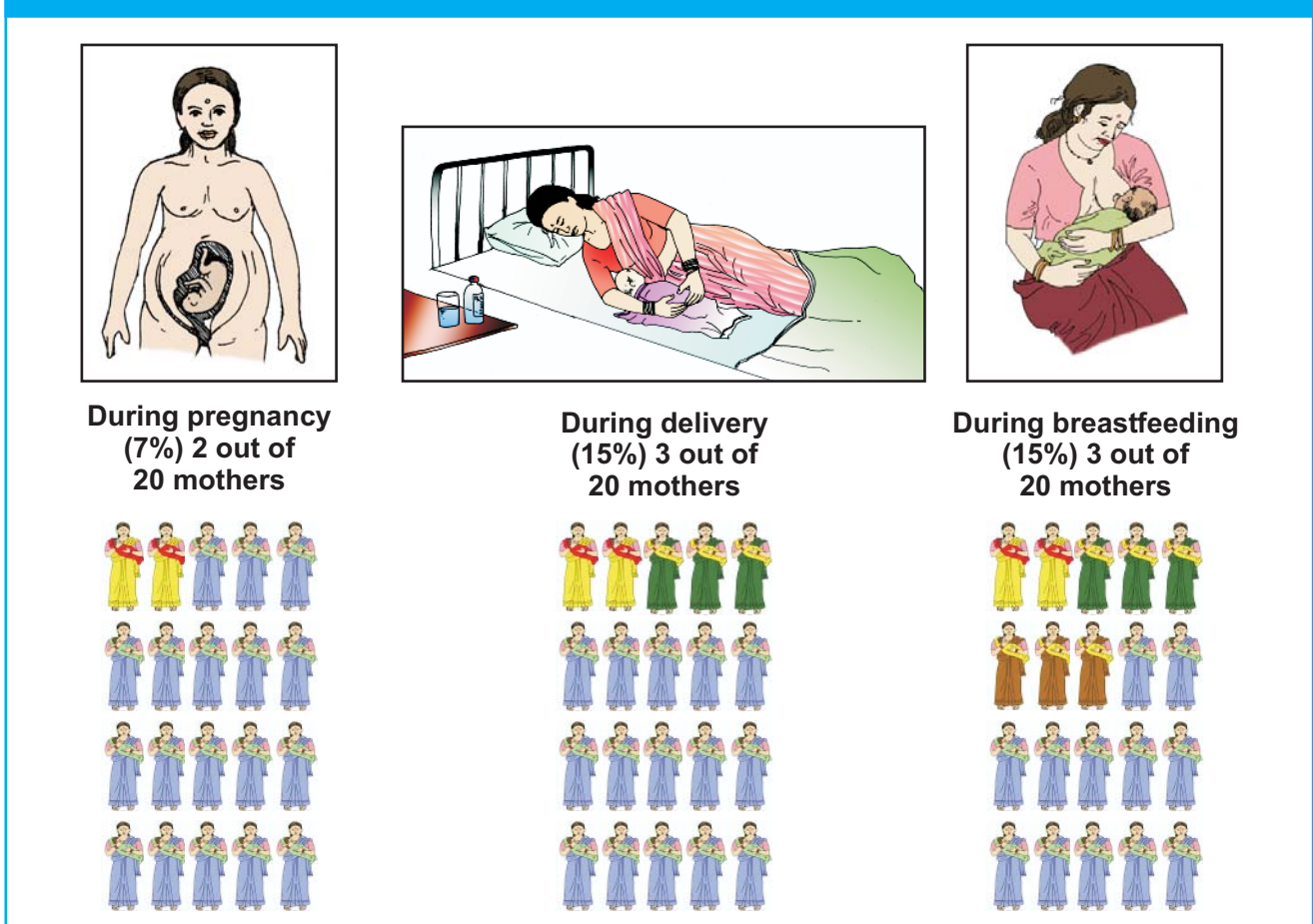
If we imagine 20 HIV+ women, taking midpoint of ranges of transmission, one would expect approximately 2 of their infants to be infected with HIV during pregnancy,

Figure 3: Timing of Mother-to-Child Transmission [Adapted from N Shaffer, CDC¹²]



another 2 during labor and delivery and another 3 over the course of about 2 years of breastfeeding; 12 infants would not become infected with HIV, even if breastfed and without any intervention in place to prevent transmission. (Figure 4)

Figure 4: Risk of transmission of HIV from mother to child



How does HIV transmission occur during breastfeeding?

HIV appears to pass from the mother's circulation into her breastmilk. Cell-free and cell-associated virus has been found in the breastmilk samples of HIV positive mothers.¹³ The virus appears to be shed intermittently over time. The HIV infected cells may also enter the milk from the mammary gland, produced locally in the mammary macrophages, lymphocytes and epithelial cells. Infants ingest HIV present in the breastmilk. The virus enters or infects the baby through permeable mucosa, lymphoid tissues, or through lesions in the gastro-intestinal tract (mouth to intestine). The most remarkable aspect of HIV transmission during breastfeeding is that, although an infant exposed to HIV may ingest a half million virions and 25,000 infected cells per day, the majority do not become infected. Immune factors in breastmilk and infant saliva are believed to play a role in preventing transmission. Data from a meta-analysis show that late postnatal transmission is around 1% per month of breastfeeding and is constant over time from between four and six weeks to 18 months i.e between 0.8 and 1.2 per 100 child months of breastfeeding. Transmission can take place at any point during breastfeeding, and longer the duration of breastfeeding, the greater the cumulative risk of transmission.¹⁴

HIV & Infant Feeding choices and HIV transmission

Parent-to-child transmission of HIV is the primary way by which children get infected with HIV. Such transmission can occur when the child is in mother's womb, around the time of birth, or through breastfeeding after birth.¹¹ In many developed countries, mothers with HIV infection were counselled not to breastfeed to prevent HIV infection. However in developing countries, where the majority of mothers with HIV infection live, complete avoidance of breastfeed is often not feasible, resulting in mixed feeding in today's culture. Giving a baby liquids other than breastmilk, or giving foods, can damage the baby's gut (stomach and intestines) and may allow the HIV virus to pass more easily into the baby's body.¹⁵ Evidence from Zimbabwe suggested that exclusive breastfeeding lowers the chances of passing HIV to the baby, may be because of special protective agents and important nutrients in the breastmilk.¹⁶ For HIV infected mother living in a poor household, it is important to consider carefully the risks related with not breastfeeding. Promotion of replacement formula feeding to prevent HIV infection in such situations might increase infant malnutrition, morbidity and mortality. Thus mortality

among HIV exposed infants on replacement feeds has been high and has negated the decreased risk of HIV transmission in such babies.^{17,18} Higher early infancy hospitalization was seen in replacement-fed infants born to HIV-infected mothers in Pune, India.¹⁹ Moreover the last decade has seen accumulation of a significant amount of research evidence and programmatic experience on antiretroviral (ARV) prophylaxis to prevent mother to child transmission of HIV infection. There is now enough evidence that ARV intervention to HIV infected mother and her infant can significantly reduce the risk of post-natal transmission of HIV through breastfeeding.²⁰ Risk of acquiring HIV infection through breastmilk is also significantly reduced by concurrent ARV interventions (Antiretroviral Therapy {ART} to the mother for her own health, ARV prophylaxis to mother and/or infant).^{21,22} With the upcoming newer evidence, WHO has revised newer recommendations on feeding of babies born to HIV positive mothers.^{23,24} Balancing the risk of infants acquiring HIV infection through breastmilk with the risk of death from causes other than HIV, particularly malnutrition and diarrhoea is the key principle for choosing feeding option now. The newer evidence will also have implications on how child health services should communicate information about ARVs to prevent HIV transmission through breastfeeding.

Various research studies have shown that IYCF counselling through the PPTCT programme helps HIV-positive mothers to undertake safer infant feeding practices.²⁵⁻²⁷ It has been found that to achieve success in exclusivity of replacement feeding, awareness campaigns are needed with adequate support for the mother.^{28,29} Various gaps have been identified in PPTCT knowledge and infant feeding practices which seem to affect appropriate infant feeding, thus giving way to practice of mixed feeding, and pre-lacteal feeding.³⁰⁻³³

In the present document, infant feeding recommendations are based on WHO guideline on HIV and Infant Feeding (2010) mentioned earlier and several previously published documents such as WHO/UNICEF Global Strategy for Infant and Young Child Feeding, WHO, 2002;³⁴ National Guidelines on Infant and Young Child Feeding of Government of India, 2004 & revised 2006² Nutrition Guidelines for HIV-Exposed and infected children (0-14 years of age, National Aids Control Organization, Ministry of Health and Family Welfare, Government of India 2012,³ the Infant Milk Substitutes, Infant foods and Feeding Bottles (Regulation of Production, Supply and Distribution) Act 1992, Amendment Act in 2003³⁵ and HIV and infant feeding counselling tools: reference guide, WHO, 2005.³⁶

4 Risk Factors for Parent - to - Child Transmission of HIV

As evident from the facts mentioned in the earlier text, not every HIV positive mother transmits the virus to the offspring. There are certain factors which may impact the transmission of HIV from mother to baby:

- 1. Immune status of the mother:** This is one of the most important predictors of HIV transmission risk at all times. CD4 T-cells are a class of lymphocytes, a part of the immune system that is infected and destroyed by the virus. A low CD4 count is both an indicator and a functional consequence of disease progression. Low CD4 T-lymphocyte counts in the mother have been associated with a greater risk of postnatal HIV transmission to the infant. In an analysis of pooled data from two West African trials, maternal CD4 cell count below 500 cells per cubic mm in plasma close to the time of delivery was associated with a 3 fold increase in the risk of late postnatal transmission compared to women with CD4 cell count equal to or greater than 500 per cubic mm.³⁷ In another meta-analysis of nine intervention trials, the risk of late postnatal acquisition of infection increased eightfold when CD4 cell counts were below 200 per cubic mm, and 3.7 fold where CD4 cell counts were between 200 and 500 per cubic mm.³⁸
- 2. RNA viral load in plasma and breastmilk:** Increased maternal RNA viral load in plasma and breastmilk are strongly associated with increased risk of transmission through breastfeeding. The rate of late postnatal transmission increased 2.6 fold for every one log₁₀ increase in plasma RNA viral load. In another study the risk of transmission increased fivefold when RNA virus had been detected in breastmilk samples taken at six weeks postpartum.³⁹
- 3. Type of Infant Feeding:** The chance of transmission of HIV is maximum if the baby receives mixed feeding i.e. breastfeeding and top feeding both. According to one study, the risk of transmission is **double** in mixed feeding in comparison to exclusive breastfeeding.⁴⁰
- 4. Breast conditions:** Cracked or bleeding nipples, mastitis or breast abscess is known to increase the risk of HIV transmission through breastfeeding. In an analysis comparing 92 infected infants with 187 infants who were infected at two years, maternal plasma RNA, mastitis and breast abscess were associated with late transmission. According to available data, 11-13 percent of HIV+ve women experience one or more breast pathologies during breastfeeding. The conditions are usually more common during the first weeks of lactation and they are preventable.⁴¹
- 5. Antiretroviral Therapy or Antiretroviral drug prophylaxis to HIV+ mothers and their babies:** There is now enough evidence that the risk of acquiring HIV infection through breastmilk is significantly reduced by concurrent ARV interventions (ART to the mother for her own health, ARV prophylaxis to mother if ART is not indicated and ARV to the infant).^{21,23} ART/ARV intervention will improve CD4 count of the mother and decreases RNA viral load in the plasma and breastmilk.
- 6. Recent infection with HIV:** A woman who has been infected with HIV during pregnancy or while breastfeeding is more likely to transmit the virus to her infant. Viral load in maternal blood is high in first few weeks after new infection until the body begins to manufacture antibodies that suppress the virus. When antibodies are formed it reduces HIV virus to low levels until the immune system begins to break down as the disease progresses, usually years later. The initial peak in viremia following infection is the probable explanation for the increased risk of transmission among infants of newly infected mothers.
- 7. Acquired Human Immunodeficiency Syndrome (AIDS):** A woman who develops AIDS is more likely to transmit HIV infection to her infant.

- 8. Infection with Sexually Transmitted Diseases (STDs):** Maternal STD infection during pregnancy may increase the risk of HIV transmission to the unborn baby.
- 9. Intervention during delivery:** Episiotomy, and instrumentation increase HIV transmission.
- 10. Duration of breastfeeding:** The longer the duration of breastfeeding, the longer the infant is exposed to the risk of HIV infection, especially where breastfeeding is mixed with other foods/drinks.
- 11. Mother's nutritional status:** A good nutritional status of mother is important as it boosts the mother's immune system and lessens progression of HIV.
- 12. Infant's oral health:** Breach in the mucosal linings of the oral cavity increases risk of HIV transmission. Vigorous suction of the mouth after birth, cheilitis, stomatitis and oral thrush are some of the conditions carrying higher risk of transmission.

5 Guidelines on HIV and Infant Feeding

World Health Organization has revised the recommendations on HIV and infant feeding in the year 2010 in view of significant programmatic experience and research evidence accumulation since the last guideline developed in 2006.²³ WHO has formulated a set of key principles and recommendation derived from the evidence reviewed at the guideline development meeting. The main points reviewed were:

1. The risk-benefit of breastfeeding and replacement feeding to improve HIV-free survival of HIV-exposed infants, taking into account interventions to improve maternal health and to prevent postnatal transmission of HIV;
2. The duration of breastfeeding according to maternal health, access to ARV interventions and environmental circumstances;
3. The support of HIV-infected women who plan to stop breastfeeding and how to meet the nutritional needs of infants after cessation of breastfeeding;
4. The feasibility and cost of supporting different infant feeding practices to improve child survival in the context of HIV.

Following are the key principles regarding HIV and infant feeding in the WHO updated guidelines:

1. *Balancing HIV prevention with protection from other causes of child mortality*

Infant feeding practices recommended to mothers known to be HIV-infected should support the greatest likelihood of HIV-free survival of their children and not harm the health of mothers. To achieve this, prioritisation of prevention of HIV transmission needs to be balanced with meeting the nutritional requirements and protection of infants against non-HIV morbidity and mortality.

2. *Integrating HIV interventions into maternal and child health services*

National authorities should aim to integrate HIV testing,

care and treatment interventions for all women into maternal and child health services. Such interventions should include access to CD4 count testing and appropriate antiretroviral therapy or prophylaxis for the woman's health and to prevent mother-to-child transmission of HIV.

3. *Setting national or sub-national recommendations for infant feeding in the context of HIV*

National or sub-national health authorities should decide whether health services will principally counsel and support mothers known to be HIV-infected to either **breastfeed and receive ARV interventions** or **avoid all breastfeeding**, as the strategy that will most likely give infants the greatest chance of HIV-free survival

This decision should be based on international recommendations and consideration of the:

- socio-economic and cultural contexts of the populations served by maternal, newborn and child health services,
- availability and quality of health services;
- local epidemiology including HIV prevalence among pregnant women;
- main causes of maternal and child under-nutrition;
- main causes of infant and child mortality.

The WHO guideline development committee noted that governments of highly resourced countries in which infant and child mortality rates were low, largely due to low rates of serious infectious diseases and malnutrition, recommend HIV-infected mothers to avoid breastfeeding completely. In some of these countries, infants have been removed from mothers who have wanted to breastfeed even when the mother is on ARV treatment. Authorities in these countries have taken the position that the pursuit of breastfeeding under these circumstances constitutes a form of abuse or neglect.

The advent of interventions that very significantly reduce

the risk of HIV transmission through breastfeeding is a major breakthrough that should contribute to improved child survival. In considering the implications for principles and recommendations, the group extensively discussed why and how a focus on individual rights is important for public health activities.

It was also noted that:

- Focusing on individual rights enhances the efficacy of public health activities;
- A focus on rights also reminds public health practitioners of their reciprocal obligations;
- Human rights principles are not barriers to essential public health activities, but they establish boundaries and parameters.

The group concluded that a more directive approach to counselling about infant feeding in which practitioners make a clear recommendation for or against breastfeeding, rather than simply presenting different options without expressing an opinion is fully consistent with an individual rights framework. In reaching this conclusion, it noted that there is no single approach to counselling and consent that is appropriate in all situations.

4. When antiretroviral drugs are not (immediately) available, breastfeeding may still provide infants born to HIV-infected mothers with a greater chance of HIV-free survival

- Every effort should be made to accelerate access to ARVs for both maternal health and also prevention of HIV transmission to infants.
- While ARV interventions are being scaled up, national authorities should not be deterred from recommending that HIV-infected mothers breastfeed as the most appropriate infant feeding practice in their setting.
- When a national authority has decided to promote and support breastfeeding and ARVs, but ARVs are not yet available, mothers should be counselled to exclusively breastfeed in the first six months of life and continue breastfeeding thereafter unless environmental and social circumstances are safe for, and supportive of replacement feeding.
- In circumstances where ARVs are unlikely to be

available, such as acute emergencies, exclusive breastfeeding of HIV-exposed infants is also recommended to increase survival.

5. Informing women known to be HIV-infected about infant feeding alternatives

Pregnant and lactating women who are known to be HIV-infected should be informed of infant feeding practices recommended by the national or sub-national authority to improve HIV-free survival of HIV-exposed infants and the health of HIV-infected mothers. They should also be informed that there are alternatives that mothers might wish to adopt.

6. Providing services to specifically support mothers to appropriately feed their infants

Skilled counselling and support in appropriate infant feeding practices and ARV interventions to promote HIV-free survival of infants should be available to all pregnant women and mothers.

7. Avoiding harm to infant feeding practices in the general population

Counselling and support to mothers known to be HIV-infected, and health messaging to the general population, should be carefully delivered so as not to undermine optimal breastfeeding practices among the general population.

8. Advising women who are HIV uninfected or whose HIV status is unknown

Mothers who are known to be HIV uninfected or whose HIV status is unknown should be counselled to exclusively breastfeed their infants for the first six months of life and then introduce complementary foods while continuing breastfeeding for 24 months or beyond. Mothers whose status is unknown should be offered HIV testing. Mothers who are HIV uninfected should be counselled about ways to prevent HIV infection and about the services that are available, such as family planning, to help them to remain uninfected.

9. Investing in improvements in infant feeding practices in the context of HIV

Governments, other stakeholders and donors should greatly increase their commitment and resources for implementation of the Global Strategy for Infant and Young Child Feeding, the United Nations HIV and infant

feeding framework for priority action¹ and Guidance on the global scale-up of the prevention of parent to child transmission (PTCT) in order to effectively prevent postnatal HIV infections, improve HIV-free survival and achieve relevant United Nations General Assembly Special Session goals.

Status of HIV and Infant Feeding programmes and policies

The UN framework for priority action on infant feeding and activities accords the highest priority to the development of a comprehensive national infant and young child feeding policy that includes HIV and infant feeding. The World Breastfeeding Trends Initiative assessment of 51 countries revealed that by 2012 only 12

countries had included infant feeding and HIV in their infant and young child feeding policy. All African countries included in the assessment except Cape Verde in general had adequate programmes for integrating infant feeding issues in HIV/AIDS than those in Asian or Latin American countries. India however needs to do much more to prioritised action and to assist and support women with HIV/AIDS to practice appropriate infant feeding. The key recommendations would be to integrate HIV and infant feeding into the IYCF policies, IYCF trainings for all levels of health providers and IYCF communication strategy. Some Asian countries who have adequately included infant feeding & HIV in their policies are Sri Lanka, Bangladesh, Bhutan, Pakistan, and Mongolia.⁴²

6 Infant Feeding Recommendations

The following text is based on WHO's Guidelines on HIV and Infant Feeding-2010²⁰

Feeding options for Infants < 6 months of age

Situation 1: Mother is on ART for her own health, started before/during pregnancy (see annexure-3)

Maternal antiretroviral therapy significantly reduces the HIV transmission through breastfeeding. Infants born to these mothers are advised 6 weeks of nevirapine (NVP) (for breastfed infants) or 6 weeks of zidovudine (ZDV) or NVP (for non-breastfed infants) to reduce the risk of early post natal transmission. Subsequently, no further prophylaxis needs to be given to the baby even if he is breastfed. In this group of infants with mothers on ART, breastfeeding would provide all its benefits, while eliminating RF associated morbidity and mortality. Maternal ART will significantly reduce the risk of HIV transmission through breastmilk. No additional drugs/interventions are needed for these infants.

Situation 2: Mother does not require ART for her own health, and has been started on one of the ARV prophylaxis regimes (annexure-3).

For this group of infants, breastfeeding is the feeding option of choice since ongoing ARV will make the breastfeeding safer.

Situation 3: Mother does not have access to ARV prophylaxis to cover the period of lactation:

In this situation, exclusive breastfeeding (EBF) is still recommended unless conditions suitable for RF are met with (see box-1). This recommendation is based on the evidence that exclusive breastfeeding is associated with reduced infant morbidity and mortality over the 1st year of life in HIV exposed as well as unexposed infants as compared to mixed & replacement feeding.

In all situations, where the woman opts to breastfeed her infant, she should be counselled to make breastfeeding further safe by adopting the following means:

- a. She should practice exclusive breastfeeding for six

months. Mixed feeding must be avoided at all costs. Exclusive breastfeeding during first six months is associated with decreased HIV transmission as compared to mixed feeding.

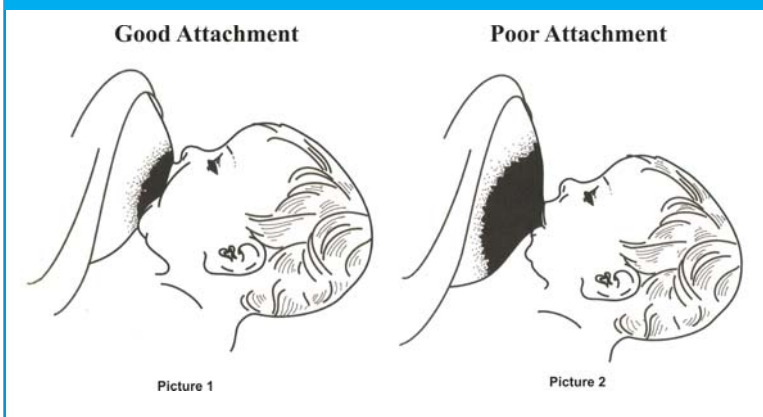
- b. She should be enabled to practice good breastfeeding techniques e.g. Baby suckling with good attachment (Figure 5). Breast conditions like mastitis, sore-nipple and abscess should be recognized and promptly managed. Mothers with mastitis, sore-nipple or abscess should not breastfeed their infants from the affected breast.
- c. Oral ulcers and oral thrush should be looked for in the infant and promptly treated.
- d. She should follow safe sex practices including use of condoms and avoid other high risk behavior to prevent re-infection throughout the period of breastfeeding.
- e. She should be advised for her own health and nutrition and seek medical help if need arises.
- F. She should be evaluated for eligibility for ART in the post-partum period if not evaluated earlier.

Box-1: Six criteria to assess for replacement feeding

Women known to be HIV-infected should give RF to their infants only when ALL of the following conditions are met:

1. safe water and sanitation are assured at the household level and in the community, and
2. the mother, or other caregiver can reliably afford to provide sufficient RF (milk), to support normal growth and development of the infant, and
3. the mother or caregiver can prepare it frequently enough in a clean manner so that it is safe and carries a low risk of diarrhoea and malnutrition, and
4. the mother or caregiver can, in the first six months exclusively give replacement feeding, and
5. the family is supportive of this practice, and
6. the mother or caregiver can access health care that offers comprehensive child health services.

Figure 5: Good Attachment and Poor Attachment



Situation 4: Mother who opt for Replacement Feeding and for situations where breastmilk is not available for the infants for example maternal death or sickness, etc:

The choice of replacement feeding will depend upon individual circumstances. The guidelines from developed countries advocate infant formula in these situations. Commercial infant feeding formula, while offering the advantage of a standard composition, is very expensive. Thus, long term administration of formula feed is likely to be beyond the means of majority of HIV infected mothers who also, in all probability, have several other reasons for limited finances. Animal milk is culturally acceptable and there is no robust scientific evidence against its use. Infants may be given animal milk which will be easily available, economical and culturally acceptable. Replacement feeding options are given in Annexure-1.

The mother opting for Replacement Feeding should be advised the following:

- She must completely avoid breastfeeding at all times.
- Mother / Caregiver should be educated and supported to practice safe replacement feeding including hygienic preparation and storage of replacement feeds and correct technique of feeding using cup/paladai/katori-spoon. Left over milk at the end of a feeding session should not be used for feeding the infant.
- The infants on replacement feeding are more prone to develop nutritional problems and infections. Ongoing support and regular monitoring are needed for early detection of nutritional deficiencies,
- A mother opting for replacement feeding may require support for management of breast engorgement in the post-natal period. She should

also be counselled regarding importance of physical contact with the baby for comforting the baby and development of mother-infant bonding.

- Provisions of IMS Act should be strictly adhered to while advising replacement feeding. It should not have an adverse effect on breastfeeding practice of HIV negative mothers. There should be no free supply of milk formula from any source.
- The parents should be counselled to use condom even if they are using another contraceptive method like an IUD or oral pills, to avoid re-infection during pregnancy.
- Mother and infant should be provided with ART/ARV as per recommendations (see Annexure-4).

In certain areas of India where wet nursing is culturally accepted & practiced, counselor should discuss this with the family in the antenatal period. It is important to be sure that the lactating woman is HIV negative and follows safe sexual practices throughout the period of lactation in order to avoid acquiring HIV infection. She should be made aware of the small but existing risk of reverse transmission of HIV infection to her in case the infant is HIV infected.

The mother may use other available alternatives like expressed heat-treated breastmilk, particularly if develops mastitis etc. The HIV virus in breastmilk can be killed by heat- treating the expressed milk. The "Pretoria Pasteurization" method was devised by the Medical Research Council for South Africa and only requires a 1 litre aluminum pot and a clean glass jar. The pot is half filled with water, which is then boiled and removed from the heat source. breastmilk is expressed into the jar (50-150 ml) and allowed to stand in water in the pot for 20 minutes, after which it is pasteurized. Tests have shown that all the HIV in the milk is killed when the milk is heated to 56-63° C for about 20 minutes. Heat-treated breastmilk should then be fed to the baby using a cup. Expressed breastmilk can stay fresh at room temperature in a covered container for up to 8 hours or in a refrigerator for up to 72 hours.

Situation 5: When the infant is HIV infected:

If infants and young children are known to be HIV-infected, mothers are strongly encouraged to exclusively breastfeed for the first 6 months of life and continue

breastfeeding as per the recommendations for the general population, that is, up to two years or beyond.

Feeding Options for > Six Months to Two years

For infants more than 6 months (180 days) of age, complementary feeding should be started irrespective of HIV status and initial feeding options. Complementary foods should be made from appropriately prepared and locally available family foods and should be given at least three times per day in breastfed and 5 times when on replacement feeds. Cup feeding should be encouraged, as cups are safer than bottles as these are easier to clean.

Ensure that energy needs are met. These needs are approximately 600 kcal per day at 6-8 months of age, 700 kcal per day at 9-11 months of age, and 900 kcal per day at 12-23 months of age.

Food consistency and variety should be increased with the child's age. By 12 months, most children can eat family foods. Meals, including milk-only feeds, other foods, and combinations of milk feeds and other foods should be provided four or five times per day. All children need complementary foods from 6 months of age.

Plain, and clean water should be offered several times a day to meet fluid needs. Attention to hygienic practices during food preparation and feeding is critical for prevention of diarrhoea. Children need more fluids and continued feeding during illness.

For situations 1 & 2 feeding option for infants less than six months of age i.e. Mother/infant receiving ART/ARV, where ART or ongoing ARV prophylaxis is being administered to the mother or infant, breastfeeding may be continued for the first 12 months of life along with complementary foods. Breastfeeding should then be stopped only once a nutritionally adequate and safe diet without breastmilk can be provided. Continuing breastfeeding for 12 months is feasible in these situations since HIV transmission risk would be further reduced in presence of ARV interventions. Although the scientific evidence so far has shown feasibility and efficacy of ARV prophylaxis in reducing HIV transmission risk till 6 months of age only, given the obvious benefits of breastfeeding, it may be reasonable to advocate continued breastfeeding till 12

months of age with ongoing ARV prophylaxis. This is a big advantage since stopping breastfeeding soon after 6 months without ensuring adequate complementary feeding may lead to growth faltering.

For situation 3 feeding option for infants less than six months of age i.e. No access to ARV, where ongoing ARV prophylaxis is not available and the mother had opted for exclusive breastfeeding, a re-evaluation should be done at 6 months. If at this time conditions suitable for replacement feeding are met (see 6 criteria, Box -2), cessation of breastfeeding is recommended as quickly as possible taking into account the comfort level of both the mother and her infant. If replacement feeding is still not feasible at this stage, continuation of breastfeeding with additional complementary foods is recommended. All breastfeeding should stop only when a nutritionally adequate and safe diet without breastmilk can be provided by complementary feeds including animal milk.

For infants who were on replacement feeding, animal milk / formula feeds should be continued as before, in addition to complementary feeds. These infants should receive two additional complementary feeds at the given age as compared to babies who continue to receive breastfeeding.

For situation 4 feeding options for infants who received replacement feeding during first 6 months: Infants should be started with appropriate complementary feeding along with continued replacement feeding.

For situation 5 feeding options for infants who are HIV infected: Breastfeeding should be continued for two years or beyond as for any other baby. HIV infected infants should receive 10-20 % extra calories. This translates to about 60-75 cal/day for infant aged 6-11 months and 80-95 cal/day for infant aged 12-23 months.

When the mother decides to stop breastfeeding

Situation 1 & 2 feeding option for infants less than six months of age: Mothers known to be HIV-infected who decide to stop breastfeeding at any time should stop

gradually within one month. Mothers or infants who have been receiving ARV prophylaxis should continue prophylaxis for one week after breastfeeding is fully stopped. Stopping breastfeeding abruptly is not advisable.

This recommendation is based on the evidence that rapid/ abrupt cessation of breastfeeding is associated with adverse consequences such as growth failure and increased incidence of diarrhoea. Breastmilk viral load is also known to spike with rapid cessation of breastfeeding. Continuing ARV prophylaxis while the breastfeeding is being stopped reduces the risk of HIV

transmission during this phase. The ARV prophylaxis is continued till 1 week after all exposure to breastmilk has ended to ensure complete clearance of circulating HIV virus from the infant's blood and tissues.

Situation 3 feeding option for infants less than six months of age i.e. No access to ARV, In the situation where ARV prophylaxis is not available, cessation of breastfeeding is recommended as quickly as possible, taking into account the comfort level of both the mother & her infant and ensuring that a nutritionally adequate and safe diet without breastmilk can be provided.

7 Epilogue

With the advent of safe anti-retroviral drugs and research showing their beneficial role in preventing Mother to Child transmission of HIV, recommendations on infant feeding in HIV positive mothers has been revolutionised. New recommendations now make a perfect balance between achieving optimum nutrition and optimum HIV free child survival in children. There is a need to adapt WHO guidelines (2010)

at country level and NACO in India has rightfully done so. Sensitisation of administrative and technical staff working with HIV positive women and community will be required to maximise benefits of revised programme guidelines. Capacity building of health care providers and counsellors working with HIV positive women on infant feeding counselling may go a long way in achieving HIV free survival for children.

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Glossary

Artificial feeding:	feeding with breastmilk substitutes
Bottle feeding:	feeding from a bottle, whatever its content, which may be expressed breastmilk, water, infant formula, or another food or liquid
Infant milk substitute:	any food being marketed or otherwise represented as a partial or total replacement for mother's milk, for infants up to the age of two years
Cessation of breastfeeding:	complete stopping of breastfeeding, including suckling
Complementary feeding:	the child receives both breastmilk or a breastmilk substitute and solid (or semi-solid) food
Complementary food:	any food, whether manufactured or locally prepared, used as a complement to breastmilk or to a breastmilk substitute
Cup feeding:	being fed from or drinking from an open cup, irrespective of its content
Exclusive breastfeeding:	an infant receives only breastmilk and no other liquids or solids, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines
HIV-infected:	refers to people who are infected with HIV, whether or not they are aware of it
HIV-negative:	refers to people who have taken an HIV test and who know that they are tested negative, or to young children who are tested negative and whose parents or guardians know the result
HIV-positive:	refers to people who have taken an HIV test and who know that they are tested positive, or to young children who are tested positive and whose parents or guardians know the result
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 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, not a one-off 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.
Infant:	a child from birth to 12 months of age
Mixed feeding:	feeding both breastmilk and other foods or liquids
Replacement feeding:	feeding infants who are receiving no breastmilk with a diet that provides all the nutrients infants need until the age at which they can be fully fed on family foods. During the first 6 months of life, replacement feeding should be with a suitable breastmilk substitute. After 6 months the suitable breastmilk substitute should be complemented with other foods.
Viral load:	the amount of HIV in the blood of an HIV-positive person

Replacement feeding options

1: Fresh Animal Milk (Cow, Buffalo or Goat)

Preparation & feeding

Mother should be instructed to always wash the feeding cups, measuring cups, spoons and other utensils that she uses to prepare and feed fresh animal milk to her baby. It is best to wash them with soap and clean water or boil them to make sure that they are clean. She should also wash hands with clean running water before preparing the milk feed and feeding the baby. She should put the milk in a clean pot and boil it and then remove immediately from the heat. She should keep it covered while it cools. She should then add sugar to the milk. The mother should feed the baby using an open cup or with katori and spoon. She should avoid using bottles and nipples as they are difficult to clean and can make the baby sick. If the baby does not drink all the milk in one feeding, boil the left over milk before adding it to another feed. Use of un-boiled milk can make the baby sick. She should be explained adequately to avoid breastfeeding, once she starts giving fresh animal milk. She should also avoid giving semisolid food or any other types of liquids to the baby till baby achieves 6 months of age.

2: Powdered Infant Formula

1. Preparation

The mother should be instructed to always wash the feeding cups, measuring cups, spoons and other utensils that she uses to prepare and feed fresh animal milk to her

baby. It is best to wash them with soap and clean water or boil them to make sure that they are clean. She should also wash hands with clean running water before preparing the milk feed and feeding the baby.

2. Amount of Powdered Infant Formula

<i>Age in Months</i>	<i>Weight in kilos</i>	<i>Approx. amount of formula (ml) per 24 hrs.</i>
1st	3	450
2nd	4	600
3rd	5	750
4th	5.5	825
5th	6	900
6th	6.5	975

3. Preparation of milk feed from powdered infant formula and feeding the baby

Mother should follow instructions on the container label to prepare a feed.



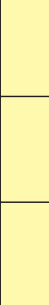
The baby should be fed using an open cup or a katori. She should avoid using bottles and nipples as they are difficult to clean and can make the baby sick. If the baby does not drink all the milk during a feed the left over milk should be discarded. She should be explained adequately to avoid breastfeeding, once she starts giving the formula. She should also avoid giving semisolid food or any other types of liquids to the baby till baby achieve 6 months of age.

Ten principles of NACO for infant feeding options for HIV infected pregnant women³

1. All HIV infected pregnant women should have PPTCT interventions provided early in pregnancy as far as possible. The interventions include either maternal or infant ARV prophylaxis during the duration of breastfeeding.
2. Exclusive breastfeeding is the recommended infant feeding choice in the first 6 months, irrespective of whether mother or infant is provided with ARV prophylaxis for the duration of breastfeeding.
3. Mixed feeding should not be practiced.
4. Only in situations where breastfeeding cannot be done or on individual parents' informed decision, then replacement feeding may be considered. However all six criteria for replacement feeding (see box 2) must be met.
5. Exclusive breastfeeding should be done for at least 6 months, after which complementary feeding should be introduced gradually, irrespective of whether the infant is diagnosed HIV negative or positive by early infant diagnosis.
6. Either mother or infant should be receiving ARV prophylaxis or ART during the whole duration of breastfeeding. ARV prophylaxis should continue for one week after the breastfeeding has fully stopped.
7. For breastfeeding infants diagnosed HIV negative, breastfeeding should be continued until 12 months of age, if the mother is on ART or ARV prophylaxis is being given to mother of infant.
8. For infants diagnosed HIV positive, ART should be started and breastfeeding should be continued till 2 years of age.
9. Breastfeeding should stop once a nutritionally adequate and safe diet without breastmilk can be provided.
10. Breastfeeding should never be stopped abruptly. Mothers who decide to stop breastfeeding should stop gradually over one month.

Infant feeding summary charts/tables: PPTCT and infant feeding options (adapted from reference no. 3)
 Note: HIV infected women become pregnant while on ART should also follow the charts below

Exclusive Breastfeeding (EBF)

ART eligibility	Mother antiretroviral drug regimens			Infant feeding choice	Infant NVP: Give first dose of NVP within 6 to 12 hours of delivery and continue daily NVP for ...	EID* results at 6 weeks	After EID results available, infant NVP to continue or stop?	EBF till	Stop BF at	Remarks
	Mother	Antenatal (AN)	During labour and delivery							
CD4 ≤ 350 cells/mm ³ irrespective of WHO Clinical Stage OR WHO Stage 3 or 4 disease, irrespective of CD4 cells count	ART regimens for mother's own health Preferred-I: AZT/3TC/NVP Alternative regimens- II: TDF/3TC/NVP III: AZT/3TC/EFV III(a): TDF/3TC/EFV	Initiate mother on lifelong ART, irrespective of pregnancy gestation and continue ART throughout AN, labour/delivery, PP and throughout Breastfeeding		EBF	6 weeks only	EID Negative	Stop at 6 weeks	6 months	12 months	Stopping Breastfeeding should be done gradually within 1 month
CD4 > 350 cells/mm ³ and WHO Clinical Stage 1 or 2	PPTCT Option B regimen if Hb <8 g/dl Regimen III(a) TDF/3TC/EFV once a day starting from 14 weeks of gestation	continue Regimen III(a) throughout AN, labour/delivery, PP and throughout Breastfeeding		EBF	6 weeks only	EID Negative	Stop at 6 weeks	6 months	12 months	Mother continue Regimen III (a) until 1 week after Breastfeeding has stopped
CD4 > 350 cells/mm ³ and WHO Clinical Stage 1 or 2	PPTCT Option A regimen if Hb ≥ 8 g/dl AZT twice daily starting from 14 weeks of gestation	AZT twice daily * sdNVP + AZT/3TC		EBF	Minimum 6 weeks and continue NVP until EID result return	EID Negative	Continue NVP during Breastfeeding until one week after Breastfeeding has stopped	6 months	12 months	Stopping Breastfeeding should be done gradually within 1 month
Confirmation of HIV status by antibody HIV test at 18 months of age, irrespective of the result of the first screening HIV tests										
Introduce complementary feeding at 6 months of age as usual										

* EID means DNA PCR screening at ICTC, and if detected positive, confirmation by whole blood sample (WBS) at the ART center
 † If maternal AZT taken for more than 4 weeks, then omit sd-NVP and AZT/3TC tail. Continue maternal AZT during labour and stop at delivery
 ‡ First assess mother if C44 still >350, then stop option B regimen. Stop EFV and give TDF/3TC for 7 days more. Follow up as usual at ART center for routine pre-ART monitoring

Infant feeding summary charts/tables: PPTCT and infant feeding options (adapted from reference no. 3)
Note: HIV infected women become pregnant while on ART should also follow the charts below

Exclusive Replacement Feeding (ERF)

ART eligibility	Mother antiretroviral drug regimens			Infant feeding choice	Infant NVP: Give first dose of NVP within 6 to 12 hours of delivery and continue daily NVP for ...	EID* results at 6 weeks	After EID results available, infant NVP to continue or stop?	ERF till	Introduce complementary feeding at 6 months of age as usual, and continue milk	Confirmation of HIV status by antibody HIV test at 18 months of age, irrespective of the results of the first screening HIV tests
	Mother	Antenatal (AN)	During labour and delivery							
CD4 ≤ 350 cells/mm ³ irrespective of WHO Clinical Stage OR WHO Stage 3 or 4 disease, irrespective of CD4 cells count	ART regimens for mother's own health Preferred-I: AZT/3TC/NVP Alternative regimens- II: TDF/3TC/NVP III: AZT/3TC/EFV III(a): TDF/3TC/EFV	Initiate mother on lifelong ART, irrespective of pregnancy gestation and continue throughout AN, labour/delivery, PP	↑	ERF	6 weeks only	EID Negative	Stop at 6 weeks	6 months		
								6 months		
CD4 > 350 cells/mm ³ and WHO Clinical Stage 1 or 2	PPTCT Option B regimen if Hb <8 g/dl Regimen III(a) TDF/3TC/EFV once a day starting from 14 weeks of gestation	start ART from 14 weeks gestation, give PPTCT option B and stop after delivery	↑	ERF	6 weeks only	EID Negative	Stop at 6 weeks	6 months		
								6 months		
CD4 > 350 cells/mm ³ and WHO Clinical Stage 1 or 2	PPTCT Option A regimen if Hb ≥ 8 g/dl AZT twice daily starting from 14 weeks of gestation	AZT	* AZT/3TC for 7 days	ERF	6 weeks only	EID Negative	Stop at 6 weeks	6 months		
								6 months		

* EID means DNA PCR screening at ICTC, and if detected positive, confirmation by whole blood sample (WBS) at the ART center

‡ If maternal AZT taken for more than 4 weeks, then omit sd-NVP and AZT/3TC tail. Continue maternal AZT during labour and stop at delivery

± First assess mother if Cd4 still >350, then stop option B regimen. Stop EFV and give TDF/3TC for 7 days more. Follow up as usual at ART center for routine pre-ART monitoring

Key Messages for Health Workers

(Adapted from reference no. 3)

- Breastfeeding is the best method for feeding infants. For women who are uninfected with HIV and for those whose status is unknown, initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life and appropriate complementary feeding along with continued breastfeeding for two years or beyond should be the preferred feeding choice.
- All HIV infected mothers should be assessed for ART according to their health status. If they don't need ART, ARV prophylaxis should be started according to NACO guidelines.
- All mothers on ART or ARV prophylaxis should be counselled for exclusive breastfeeding keeping in mind decreased risk of transmission with ART/ ARV prophylaxis and advantages of breastfeeding in preventing mortality, diarrhoea, malnutrition & other morbidities.
- When mother does not need ART and ARV prophylaxis is not available, in this situation also advantages of breastmilk should be informed. Inform the mother and family about the risk of transmission through breastmilk and other feeding options if mother/ family asks for. Assess 6 criteria for replacement feeds if mother or family wishes for replacement feed.
- In situations where breastfeeding cannot be done or individual mother chooses not to breastfeed, replacement feeding may be considered only if all the 6 criteria for replacement feeding are met.
- In poor socio-economic conditions, not breastfeeding may have higher mortality risks for the infant than exclusive breastfeeding by HIV positive mothers.
- Breastfeeding mothers should practice safe sex to avoid infection or re-infection with HIV.
- For an HIV positive mother considering infant feeding options, exclusive breastfeeding for the first six months or exclusive replacement feeding is better than mixed feeding.
- Mothers who choose to give replacement feeding should be aware of the importance of hygienic preparation, correct measurement of replacement feeds and proper cleaning of cups and utensils.
- Infants and young children who are not breastfed need extra care, love and close contact with caretakers.
- Mothers who are not breastfeeding need contraceptives to delay next pregnancy.



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BPNI is a registered, independent, non-profit, national organisation that works towards protecting, promoting and supporting breastfeeding and appropriate complementary feeding of infants and young children. BPNI works through advocacy, social mobilization, information sharing, education, research, training and monitoring the company compliance with the IMS Act. BPNI is the Regional Focal Point for South Asia for the World Alliance for Breastfeeding Action (WABA) and Regional Coordinating Office for International Baby Food Action Network (IBFAN) Asia.

As a policy, BPNI does not accept funds of any kind from the companies producing infant milk substitute, feeding bottles, related equipments, or infant foods (cereal foods) or from those who have been ever found to violate the IMS Act or the International Code of Marketing of Breast-milk-Substitute or from organization/industry having conflict of interest.

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