

Exclusive breastfeeding – what is its place in HIV prevalent areas?

How do we approach exclusive breastfeeding in the era of HIV?

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The HIV pandemic has created confusion, misunderstanding and fierce debate about infant feeding. The *Global Strategy for Infant and Young Child Feeding*¹ states that the optimal feeding pattern for overall child survival is exclusive breastfeeding (Table I) for the first 6 months, and continued breastfeeding for up to 2 years and beyond, with complementary feeding from age 6 completed months.

These recommendations pose a dilemma for HIV-positive women, due to the risk of HIV transmission through breastmilk. In 2001 WHO and UNICEF gave the following infant feeding guidance for infected mothers:

When replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS), avoidance of all breastfeeding by HIV-infected mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first months of life. To minimise 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).

Operationalising these recommendations is challenging. Balancing the risks and benefits of different feeding modes is complex in many areas of the world, including parts of South Africa, where access to safe replacement feeds and support for infant feeding are limited.

The dilemma around infant feeding hinges around the following facts:

- Exclusive breastfeeding is recommended as the best way to feed a child from 0 to 6 months of age. It is nutritionally adequate and reduces morbidity and mortality from infectious diseases, particularly diarrhoea and pneumonia.

BUT

- HIV is present in breastmilk and there is a risk of postnatal HIV transmission from mother to child as long as breastfeeding continues.
- Replacement feeding (i.e. avoidance of all breastmilk from birth) carries no risk of postnatal transmission of HIV.

BUT

- Avoidance of breastfeeding carries risks of illness, malnutrition, and the possibility of discrimination against mothers who do not breastfeed.

Health care staff, policy makers and individual HIV-positive women have to weigh up the risks of breastfeeding against the risks of *not* breastfeeding. In order to do this, they need accurate, consistent and up-to-date information.

What are the HIV transmission risks associated with breastfeeding?

There is confusion among health workers about the actual risks of transmission through breastfeeding (postnatal transmission). Figures quoted for postnatal HIV transmission range from 0% to 100%, with 15% being the percentage most commonly given. However, this figure is based on early studies, which did not document the exact duration of breastfeeding (for example, for 2 months, 6 months, or 2 years) or the pattern of breastfeeding (no differentiation between women who 'exclusively breastfeed' and those who used 'mixed feeding'). The figure of 15% is based on 'mixed feeding' into the second year of life, and does not take into account strategies that make breastfeeding safer for HIV-positive women. Two of these strategies are to practise exclusive, as opposed to mixed, breastfeeding and to shorten the duration of breastfeeding.

For the first time a study, reported in 1999 by Coutsooudis and colleagues² from South Africa, compared mother-to-child transmission rates in three feeding groups: exclusive breastfeeding for at least 3 months ($N = 118$); partial or mixed breastfeeding during the first 3 months ($N = 276$); and exclusive formula feeding for the first 3 months ($N = 157$). The estimated proportion of infants HIV-infected by 3 months was significantly lower in those exclusively breastfed up to 3 months than in those who received mixed feeding before 3 months. After adjustment for potential confounders, exclusive breastfeeding carried a significantly lower risk of HIV-1 transmission than mixed feeding (hazard ratio 0.52 (0.28 - 0.98)), and a similar risk to no breastfeeding (0.85 (0.51 - 1.42)). However, these findings were obtained from a trial whose main purpose was to test the efficacy of vitamin A in reducing mother-to-child transmission, so further studies were required to prove or refute this hypothesis.

The results of two such studies have recently been presented: the Zvitambo study from Zimbabwe³ and the Vertical Transmission Study from South Africa.⁴

Zvitambo Study

This study demonstrated a lower postnatal transmission among exclusively breastfed infants compared with those who were predominantly breastfed or mixed fed (see Table II). In this study,

Table I. Definition of feeding terms (World Health Organization)

Term	Explanation
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
Predominant breastfeeding	The infant's predominant source of nourishment is breastmilk. However, the infant may also have received water or water-based drinks (e.g. fruit juice or sugar water). No food-based fluid is allowed under this definition
Partial breastfeeding	An infant receives some breastfeeds and some artificial feeds, either milk or cereal, or other food
Mixed breastfeeding	Feeding both breastmilk and other foods or liquids (includes predominant and partial breastfeeding)
Replacement feeding	Feeding infants who are receiving no breastmilk with a diet that provides 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
AFASS criteria	The criteria required for replacement feeding: acceptable, feasible, affordable, sustainable and safe

breastfeeding duration was prolonged, with 59.1% of mothers still breastfeeding at 18 months. However, only 156 babies (7.6%) were exclusively breastfed for at least 3 months, compared with 490 (23.8%) and 1 414 (68.6%) infants who were predominantly breastfed and partially breastfed, respectively, to at least 3 months.

Vertical Transmission Study

The Vertical Transmission Study from South Africa followed 2 722 mothers and infants postnatally (1 372 HIV-infected and 1 345 uninfected women).⁴ Standard WHO feeding definitions were used (see Table I), and a rigorous determination of cumulative exclusive breastfeeding rates using daily records of feeding practices based on a 6 - 9 day recall period. This compared with most previous studies that reported infant feeding practices based on previous 24 hours, 6 week or 3 month recall intervals. Complete feeding data were available on 1 276 HIV-positive women. The median duration of exclusive breastfeeding for infants included in the analysis of postnatal HIV transmission was 159 days (interquartile range (IQR) 122 - 174).

Study findings were:

- The risk of postnatal HIV transmission to exclusively breastfed (EBF) infants between 6 weeks and 6 months of age was 4%.
- There was an almost 11-fold difference in postnatal transmission risk between EBF infants and infants who received breastmilk as well as solid foods during the first 6 months (hazard ratio 10.87; 95% CI: 1.51 - 77.80, $p = 0.018$).
- There was a nearly twofold increased risk of postnatal transmission between EBF infants and infants who received

both breastmilk and formula milk during the first 6 months (hazard ratio 1.82; 95% CI: 0.98 - 3.36, $p = 0.057$).

- Infants born to and breastfed (EBF or otherwise) by HIV-infected women with CD4 counts less than 200 cells/ml were almost 4 times more likely to become infected postnatally and/or die than infants born to mothers with CD4 counts of more than 500.

In summary, both the Zvitambo and Vertical Transmission Studies confirm the findings by Coutsooudis *et al.*, that exclusive breastfeeding for a short duration (that is, 6 months or less) carries a postnatal transmission risk of less than 5% and a much lower risk than mixed breastfeeding.

What are the risks of not breastfeeding?

There is no argument that many HIV-positive women fulfil the AFASS criteria (see Table I) and can appropriately avoid breastfeeding and give replacement feeds to their infants. They should be supported and encouraged to do this. This is usually in more developed urban environments, with good access to clean piped water,

supplies of fuel, a fridge, and a clinic to collect monthly supplies of formula milk and attend for regular infant growth monitoring.

Unfortunately, for many women the complete avoidance of breastfeeding is not realistic. For them, a decision to use replacement feeds is critically important as it may potentially save their child's life or expose their newborn infant to unacceptably high risks of diarrhoea and malnutrition.⁵

Evidence from observational studies has documented increased mortality among non-breastfed infants. A meta-analysis of available data from 6 studies, with data on all-cause death for 1 123 children under 2 years of age, showed that non-breastfed infants are at higher risk of mortality than those who are breastfed. There was a 6-fold increased protection against diarrhoeal deaths by breastfeeding and a 2.4-fold protection against respiratory deaths in the first 6 months of life.⁶ In a study from the Philippines, deaths from diarrhoeal diseases were 10 times more common for infants under 6 months of age who were never breastfed or whose breastfeeding was stopped, compared with those who were breastfed.⁷

Table II. Cumulative percentage (95% confidence interval) with HIV infection at 6 months of age according to early breastfeeding pattern among infants born to HIV-infected mothers³

Breastfeeding pattern	N (2 060)	6 months
Exclusive	156	1.31 (0.00 - 3.29)
Predominant	490	3.03 (1.56 - 4.75)
Mixed	1 414	4.40 (3.30 - 5.52)

Balancing the risks and benefits of different feeding modes is complex in many areas of the world, including parts of South Africa, where access to safe replacement feeds and support for infant feeding are limited.

Pneumonia is one of the leading causes of death in children under 5 years, worldwide. In Brazil, considered similar to South Africa in terms of its socio-demographic profile, although without the high HIV prevalence, non-breastfed infants had a significant and substantially increased risk of hospitalisation for pneumonia (risk of admission was 17 times greater among infants who were not being breastfed) compared with breastfed infants.⁸

These studies were in areas with low HIV prevalences. Recently the risks of formula feeding in southern Africa have been highlighted. From November 2005 to February 2006, heavy rains caused floods in Botswana. In the first 3 months of 2006 there were 22 500 cases of diarrhoea in 12 health districts, with 470 deaths in children under 5 years (compared with 9 166 cases of diarrhoea and 21 deaths for the entire country in the first 3 months of 2005).⁹ A number of risk factors were identified for children with diarrhoea visiting the emergency room, such as caregivers not washing hands and overflowing latrines. However, the most significant was not breastfeeding (adjusted odds ratio (AOR) 50 (95% CI 4.5 - 100)).

The Botswanan Mashi study was also published this year.¹⁰ This trial compared the efficacy and safety of 6 months of AZT (azidothymidine) plus exclusive breastfeeding versus 1 month of AZT plus formula feeding for the prevention of postnatal HIV transmission. Adherence to exclusive breastfeeding was low, and although HIV transmission was higher in the breastfeeding arm, there was little difference in the combined mortality and/or HIV infection, because early infant mortality was much higher in the formula-fed arm (cumulative infant mortality at 7 months: 9.3% v. 4.9%, $p = 0.003$, in the formula-fed and breast-fed arms, respectively).

Settings and individual households differ – one policy does not fit all. Infant health and survival at 24 months in a study from Abidjan, Côte d'Ivoire, where women choosing formula feed were more likely to be highly educated and to have access to personal piped water, showed little difference between infants who were formula fed or exclusively breastfed with early weaning at around 4 months.¹¹

Is exclusive breastfeeding possible?

Few women worldwide practise exclusive breastfeeding, and many health providers doubt its feasibility. In sub-Saharan Africa 23% of infants (born to HIV-infected and uninfected mothers) under 6 months of age are exclusively breastfed.¹² Reasons why mothers start mixed feeding include: a perception of insufficient breastmilk, concern over a crying baby, family beliefs/pressures, breast health problems, and returning to school or work.¹³

There is evidence that it is possible to increase rates of *exclusive* breastfeeding. Hospital programmes, designed around the baby-friendly hospital initiative (BFHI), have shown a significant impact on breastfeeding outcomes and early rates of exclusive breastfeeding, but often these effects are not sustained in the community.¹⁴

Studies in Mexico and Bangladesh evaluated the use of peer counsellors to provide breastfeeding support. Increased exclusive breastfeeding rates of 67% at 3 months (compared with 12% in the control group) were reported from Mexico,¹⁵ and 70% at 5 months (compared with 6% in the control group) from Bangladesh.¹⁶ Both studies were conducted in areas of low HIV prevalence.

In the Vertical Transmission Study, Kwa-Zulu-Natal,⁴ we also assessed the feasibility of promoting optimal feeding practices to both HIV-negative and -positive women. All HIV-negative women were encouraged to exclusively breastfeed for 6 completed months, with continued breastfeeding up to 2 years. All HIV-positive women were counselled individually, according to the UN guidelines, to help them find a feeding option most suited to their socio-economic situation. Women were supported in whatever feeding choice they made. Those choosing to breastfeed were supported at home by lay counsellors.

The median duration of EBF was 177 (R 1 - 180, IQR 150 - 180) and 175 days (R 1 - 180, IQR 137 - 180) in HIV-negative and -positive women respectively. At 5½ months of age, over 60% of infants born to HIV-positive

and HIV-negative women were still exclusively breastfeeding.

We achieved high rates of exclusive breastfeeding in HIV-negative women, demonstrating that with high-quality counselling and support, 'spillover' of inappropriate feeding practices and erosion of breastfeeding practices did not occur among uninfected women.

Summary

There are numerous misconceptions around infant feeding in HIV-affected communities. Sadly, mothers often do not receive consistent information on infant feeding, or appropriate support to carry out their chosen feeding method.

There was an almost 11-fold difference in postnatal transmission risk between exclusively breastfed infants who received breastmilk as well as solid foods during the first 6 months of life.

However, we now have definitive HIV transmission risks associated with exclusive breastfeeding and models of how to promote exclusive breastfeeding in communities. Exclusive breastfeeding continues to have a place for the large majority of HIV-positive women in sub-Saharan Africa who cannot replacement feed safely (AFASS) and who wish to breastfeed for cultural reasons, and for the even larger group of HIV-negative women or women of unknown status.

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There is confusion among health workers about the actual risks of transmission through breastfeeding (postnatal transmission).

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Unfortunately, for many women the complete avoidance of breastfeeding is not realistic.

In a nutshell

- For HIV-negative mothers and those who do not know their HIV status, the optimal feeding method from birth to 6 months is exclusive breastfeeding.
- HIV-positive women have to make the difficult choice of formula feeding or exclusive breastfeeding (i.e. avoidance of mixed feeding).
- HIV is present in breastmilk.
- Exclusive breastfeeding carries a postnatal HIV transmission risk of less than 5% at 6 months.
- Exclusive breastfeeding carries a much lower postnatal HIV transmission risk than mixed breastfeeding.
- Avoidance of breastfeeding carries increased risks of dying from infectious diseases e.g. diarrhoea and pneumonia.
- It is possible for women to exclusively breastfeed for 6 completed months if they are given support.