

Human Immuno-deficiency Virus and Infant Feeding in Complex Humanitarian Emergencies: Priorities and Policy Considerations

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Issues surrounding mother-to-child transmission of HIV/AIDS pose considerable challenges in complex humanitarian emergencies. The risk of vertical transmission through breastfeeding is well recognised, but safe alternatives are limited by the social, economic and environmental conditions of emergency situations. In 2000, the World Health Organisation published a technical report on behalf of the UNFPA/UNICEF/WHO/UNAIDS Inter-agency Task Team on Mother-to-child Transmission of HIV which outlined revised recommendations for infant feeding by HIV-positive women. This paper outlines reasons why these recommendations may be insufficient during the initial stages of complex humanitarian emergencies and proposes recommendations for establishing infant-feeding policy. Methods of mother-to-child transmission of HIV are reviewed and recent research findings are discussed. Rationale for modifying the 2000 UNFPA/UNICEF/WHO/UNAIDS infant-feeding recommendations in complex emergency situations is explored from the perspective of the infant, the mother and humanitarian field staff. Ethical limitations and future priorities are considered. The paper concludes with recommendations and a policy decision-making framework for consideration during the initial stages of humanitarian crises.

Keywords: infant nutrition, HIV, acquired immuno-deficiency syndrome, world health, disaster planning, infant formula, breastfeeding.

Introduction

The HIV/AIDS pandemic continues to have tremendous social, economic and political impact throughout the developing world. The joint UN Programme on HIV/AIDS (UNAIDS) estimates that, at the end of 2002, there were 42 million adults and children living with HIV/AIDS (UNAIDS, 2002). Of the estimated 14,000 new infections that occurred each day in 2002, more than 95 per cent were in developing countries. Sub-Saharan Africa carries the majority of the disease burden as home to 10 per cent of the world's population and containing 70 per cent of total HIV infections.

While HIV/AIDS poses tremendous multi-sectoral challenges under stable environmental and political circumstances, its association with complex humanitarian crises is of even greater concern. Smith (2002) has described a twofold relationship between HIV and complex emergencies. First, the vast majority of humanitarian crises occur in countries where rates of HIV are already high. Second, the displacement, poverty and social instability often associated with emergencies can intensify

vulnerability in several ways, increasing the risk of HIV infection among affected populations.

The increased vulnerability to HIV/AIDS is most frequently discussed in the contexts of sexual abuse and commercial sex work in emergency settings. Women and children may be targeted in campaigns of terror or because of their physical vulnerability during displacement or flight (UNHCR/WHO/UNAIDS, 1995). Distanced from normal economic and social circumstances, commercial sex work may be viewed as a sole means of survival. Recognising the magnitude of the problem, UNHCR has implemented a policy strongly urging governments and NGOs to integrate practices to prevent HIV spread from the outset of emergency situations.

While vulnerability to sexual abuse and commercial sex work undoubtedly influences HIV transmission among women and children, the risk of mother-to-child transmission (MTCT) during pregnancy, delivery and lactation is also a major threat to infants in complex emergency settings. In fact, given the high rates of sexual abuse in emergency settings and the fact that mother-to-child transmission of HIV is highest during the period of primary maternal infection, vertical transmission may increase during complex humanitarian emergencies (Khaw et al., 2000). Reduction of vertical transmission during pregnancy and delivery is primarily dependent on anti-retroviral treatment, the availability of which is limited even in stable political contexts in most of the developing world. In the absence of anti-retroviral therapy, methods of reducing MTCT during the post-partum period have been discussed. Knowledge about HIV transmission during breastfeeding is increasing and significant debate exists about the appropriateness of breastfeeding the infants of HIV-positive women in developing countries.

While policy documents have been written to address infant feeding in complex humanitarian crises as well as infant feeding and HIV in stable situations, no comprehensive review has examined the issues of HIV/AIDS and infant feeding in complex humanitarian emergency settings. The purpose of this paper is to review the challenges of infant feeding in emergency settings in light of the HIV/AIDS pandemic and discuss why the 2000 UNFPA/UNICEF/WHO/UNAIDS recommendations may be insufficient for policy formation during the initial stages of complex humanitarian emergencies. Our current understanding of mother-to-child-transmission of HIV via breastfeeding is discussed and alternatives are explored. The paper concludes with recommendations for policy development in emergency settings where HIV is endemic — that is, much of the developing world.

Breastfeeding and mother-to-child transmission of HIV

Breastfeeding has long been considered the optimal, single source of nutrition for infants up to six months of age. From a nutritional perspective, breast-milk provides all of the micro- and macro-nutrients required for growth and development during this age range. Breastfeeding may continue to provide up to 50 per cent of nutritional requirements in the second six months of life and up to one-third of requirements during the second year (UNFPA, 2000). Breast-milk also has immunological benefits as it contains antibodies and anti-infective factors that provide passive immunity against many viral and bacterial agents. It is optimal in resource-poor settings as no additional equipment or supplies are required. Maternal benefits include infant

attachment and birth-spacing, which is associated with suppression of ovarian follicular secretions during the period of lactation (Neville, 2001).

Breast-milk substitutes, which are a mix of dried powder and water, require a clean water supply as well as technical competence in measuring appropriate proportions. Clean equipment is also required for infant feeding. The costs of infant formula are substantial; nationally produced, market-priced infant formula in Kenya costs \$300 for six months' supply (Nduati et al., 2000), a price that is prohibitive for many women in the developing world. Furthermore, use of breast-milk substitutes has been associated with significant morbidity and mortality from diarrhoeal and respiratory disease (WHO, 2000).

Prior to the widespread existence of HIV and the realisation that HIV could be transmitted in breast-milk, the World Health Organisation recommended that all infants in resource-poor nations be breastfed exclusively until six months of age. However, as knowledge about the factors contributing to mother-to-child-transmission increased, considerable debate about the appropriateness of these recommendations was voiced. In October 2000, an Inter-agency Task Team was convened in Geneva by WHO, UNICEF, UNFPA and UNAIDS to review recent data on mother-to-child-transmission (MTCT) and to develop new recommendations. The infant-feeding recommendations may be summarised as follows (UNFPA/UNICEF/WHO/UNAIDS, 2000):

- When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breast-feeding by HIV-infected mothers is recommended. In the absence of these stipulations, exclusive breast-feeding is recommended.
- To minimise HIV-transmission risk, breastfeeding should be discontinued as soon as feasible, taking into consideration local circumstances and the risks of breast-milk alternatives.
- When HIV-infected mothers choose not to breastfeed, they should be given guidance and support for the first two years of the child's life to ensure adequate replacement feeding.

While these recommendations highlight the significance of MTCT issues, several questions remain about the optimal duration and patterns of breastfeeding. Furthermore, in a great many resource-poor environments, replacement feeding is not acceptable, feasible, affordable, sustainable or safe. Under such circumstances, the balance of risks and benefits in choosing breastfeeding over breast-milk alternatives needs further assessment.

Rates of peri-natal HIV transmission have been estimated to range from 14 per cent to over 40 per cent in the absence of anti-retroviral treatment (Fawzi et al., 2002). Transmission may occur in three phases: intra-uterine (during pregnancy); intra-partum (during labour and delivery); and post-natal (after delivery) through breast-milk. The majority of infections occur during labour and delivery. However, 14 to 20 per cent of infant HIV infections may occur during breastfeeding (Fawzi et al., 2002; Simonon et al., 1994). Given that adult HIV-prevalence rates are greater than 10 per cent in almost all countries in Sub-Saharan Africa and that fertility rates remain high, the potential benefits of averting these additional infections are enormous.

Infection of infants with HIV through breastfeeding is hypothesised to occur by direct entry of the virus into the bloodstream through breaches in the gastrointestinal mucosa. A study by Mioti et al. (1999) suggests that about 68 per cent of HIV infections from breastfeeding occur during the first five months of life. Similarly, a

Kenyan study by Nduati et al. (2000) found that 75 per cent of infections occurred during the first six months. Although these studies suggest that the majority of infections occur early in life, Fawzi et al. (2002) have shown that transmission of HIV through breast-feeding may continue up to 24 months of age. Breast infections in the mother, including mastitis and breast abscesses, have been shown to increase the risk of transmission (Semba et al., 1999). Greater maternal viral loads and advanced stage of disease are also risk factors for HIV transmission (Garcia et al., 1999).

To understand the complexity of factors that may contribute to HIV transmission through breastfeeding in resource-poor environments, two landmark studies warrant discussion. The first, performed by Nduati and colleagues in Kenya (2000), examined the risks of HIV transmission and infant mortality associated with breastfeeding relative to mortality rates from other causes associated with using breast-milk substitutes. The study is unique in its randomised control design; mother-infant pairs were randomised to exclusive breastfeeding or exclusive formula feeding. All women participating in the study had access to clean water and all were required to show competency in preparation of infant formula in order to participate. Women randomised to the formula-feeding arm were provided with formula free of charge. Not surprisingly, at 24 months of age the cumulative probability of HIV infection was significantly higher in infants randomised to breastfeeding than in those randomised to formula (36.7 per cent vs 20.5 per cent, $p < .001$). However, in comparing all-cause mortality at 24 months, infants randomised to the formula-feeding arm had a mortality rate of 20 per cent while the mortality rate was 24.4 per cent in the breastfeeding arm, a difference that is not statistically significant. This finding provides support for previous studies that have suggested that even under relatively controlled circumstances, morbidity and mortality from formula feeding are not inconsequential and may in fact parallel rates mortality rates associated with MTCT of HIV.

Because HIV is a fatal disease in the absence of treatment, Nduati and colleagues went on to compare infant HIV-free survival at 24 months of age, arguing that this measure may be most reflective of long-term outcome. The percentage of infants who were dead or infected at 24 months was significantly higher in the breastfeeding group than in the formula-feeding group (42 per cent vs 30 per cent; $p = .02$). In other words, the HIV-free survival rate among the formula-fed infants was 70 per cent, significantly greater than the 58 per cent HIV-free survival rate in the breastfed group. In accordance with recommendations by the Data Safety and Monitoring Board, these findings prompted premature completion of the study with all breastfed infants being recommended to switch to breast-milk substitutes.

This study instigated significant discussion because it was the first randomised study in a resource-poor nation to suggest that formula feeding may be optimal in areas of high HIV prevalence. While the 24-month mortality rate was not statistically different between the two groups, the greater HIV-free survival at 24 months in the formula-fed group suggests that formula feeding should be considered in some settings outside the industrialised world. A key criticism of the study, however, was the relatively poor compliance with the assigned feeding protocol; adherence to exclusive formula feeding occurred in only 71 per cent of women and only 9 per cent of women were exclusively breastfeeding at six months (Tompson, 2001). This element of non-compliance is remarkable for two reasons. First, it illustrates the pervasiveness of the cultural norm to provide infants with mixed feeds, despite counselling and education. Second, the non-compliance may have biased the study results, raising questions about the study's validity.

A second key study that must be considered in contemplating the risks and benefits of breastfeeding in resource-poor nations was carried out by Coutsooudis et al. (1999) in Durban, South Africa. Coutsooudis et al. followed mother-infant pairs to three months of age and compared rates of HIV vertical transmission in infants in three groups:

- infants who were exclusively breastfed (no additional water, herbal teas or cereals);
- infants who received mixed feeding (primarily breastfed, but some supplementary water or foods were provided); and
- infants who were formula fed exclusively.

The results were surprising: the investigators found that exclusive breastfeeding was associated with approximately half the risk of mother-to-child transmission of HIV than mixed feeding at three months of age (8.3 per cent vs 19.9 per cent, $p < 0.01$). Interestingly, there was no significant difference in the rates of HIV transmission in infants who were never breastfed compared to those who were exclusively breastfed. A follow-up study revealed that differences in rates of transmission between the groups remained statistically significant to six months (Coutsooudis et al., 2001).

Taking these two studies in the context of other recent work carried out in developing nations, the question arises: are changes to the UNFPA/UNICEF/WHO/UNAIDS recommendations warranted? The study by Nduati et al. suggests that under certain circumstances in resource-poor nations, breast-milk alternatives may be preferable, a concept that is highlighted in the feeding recommendations. It must be noted, however, that the women in this study were not necessarily representative of the general population and were provided with infant formula free of charge. Conclusions drawn from the study by Coutsooudis et al. are somewhat different. On first glance, the finding that exclusive breastfeeding resulted in an infant HIV-prevalence rate equivalent to that of the never-breastfed group seems to provide an ideal solution to the breastfeeding-or-formula-feeding dilemma. However, this is the only study that has suggested these potential benefits of strict, exclusive formula feeding; while the study provides support for UNFPA/UNICEF/WHO/UNAIDS Task Team's recommendation that breastfeeding should be exclusive, it may be premature to advocate breastfeeding in all population groups based on the results of one study. While the results seem biologically plausible — that contaminants in mixed feeds could lead to inflammation of the gastrointestinal mucosa, providing a portal of entry for the virus present in breast-milk (Coutsooudis et al., 1999) — several questions remain about the risk of HIV transmission during weaning when complementary feeds are introduced. It is clear from the aforementioned studies, as well as other published works, that many questions remain about optimal feeding practices in stable situations of high HIV prevalence. Given these many 'unknowns' under stable political, economic and social circumstances, what recommendations can be made for infant feeding in complex-emergency situations?

Considerations in developing policy guidelines for emergency settings

As the aforementioned review of recent studies suggests, the biological and physiological issues relevant to MTCT of HIV are complex. The revised recommendations made by WHO, UNICEF, UNAIDS and UNFPA in 2000 reflect both the progress that has been made in knowledge of MTCT through breastfeeding, as well as the difficulties inherent in making recommendations given incomplete knowledge and resource scarcity. In considering the circumstances unique to complex humanitarian emergency situations, a number of additional considerations become relevant. How should recommendations be tailored given the social, economic, political and environmental changes associated with complex emergencies? These questions may be considered from three perspectives: that of the infant, that of the mother and that of humanitarian field staff. Cultural, ethical and setting-specific issues create a backdrop for discussion.

Maternal health considerations

In contemplating the morbidity and mortality associated with breastfeeding and its alternatives, the risks and benefits to infants have been at the forefront of discussion. However, an interesting study by Nduati and colleagues (2001) highlights that maternal health may also be influenced by infant-feeding choices. The study, drawn from a secondary analysis of data collected for the aforementioned randomised controlled trial of infant-feeding alternatives, suggested that breastfeeding may be associated with a threefold increased risk of maternal mortality compared to formula feeding among HIV-positive women. The cumulative probability of maternal death 24 months after delivery was 10.5 per cent in the breastfeeding arm of the trial and 3.8 per cent in the formula-feeding group. In addition, there was an association between maternal death and subsequent infant death, even after controlling for HIV status. The investigators hypothesised that the increased metabolic demands associated with lactation and HIV could result in nutritional insufficiency and thereby increase mortality risk. Women in the breastfeeding group had greater weight loss post-partum than women in the formula feeding group, a factor that was associated with maternal death.

This study has been criticised for being an ad-hoc intention to treat analysis with relatively small numbers and high levels of non-compliance with the assigned treatment protocols (Tompson, 2001). A similar study of retrospective design by Coutoudis et al. (2001) did not find a difference in maternal mortality rates among breastfeeding and formula-feeding groups. Despite this, a number of issues relevant to complex humanitarian emergency settings remain. First, maternal health outcomes and infant health outcomes are closely linked. In the study by Nduati et al., infants of mothers who had died had a threefold increased risk of death by 24 months of age and a 7.9-times increased risk of subsequent death, even after controlling for infant HIV status. This is consistent with other studies in Africa that have shown a three- to fourfold increased risk of death in children whose mothers have died (McDermott et al., 1996; Taha et al., 1996). In complex emergency settings, estimates of infant death and its association with maternal death are difficult to establish as the greatest numbers of deaths may occur during periods of flight and displacement before mortality surveillance systems are established. However, one may certainly hypothesise that in

these situations of increased physiological stress and physical vulnerability that accompany complex emergencies, the risk of infant death given maternal death may increase beyond these threefold estimates.

It is important to recognise that the ultimate aim in discussing infant-feeding alternatives is to maximise infant survival and quality of life. Contracting HIV through breast-milk will result, almost universally, in infant or childhood death in the majority of developing nations given the general lack of anti-retroviral therapies. However, if breastfeeding or formula feeding has any impact on maternal survival, infant survival rates may be adversely affected, independent of HIV transmission. Recognising these associations, factors affecting maternal survival in complex emergency settings must be considered broadly.

Inconsistencies in published data and weaknesses in the aforementioned study limit one's ability to conclude that the health of HIV-positive mothers is adversely affected by breastfeeding via physiological mechanisms. Further studies are needed to explore this association; if the finding is robust, its implications are significant. However, the potential risks of formula feeding to maternal health also warrant discussion. In situations of complex humanitarian crises, it is widely recognised that women are at increased risk of physical and sexual abuse and death given the loss of their usual social supports and the physical vulnerability associated with displacement. Given the stigma and discrimination associated with HIV in many developing nations, one may certainly hypothesise that women whose HIV status is known may be at increased risk of abuse or death. In fact, UNHCR opposes mandatory HIV testing of refugees because of such increased risks (Smith, 2002). Recognising this, the social implications of recommending formula feeding to HIV-positive women must be considered. Breastfeeding has been encouraged by health-care providers and NGOs for decades; discussions about using formula stem almost exclusively from the rising incidence of HIV. Therefore, use of infant formula may be seen as a declaration of HIV-positive status among many communities and cultures. The establishment of different recommendations for HIV-positive women may increase rates of maternal morbidity or mortality by abuse and, by association, result in increased rates of infant death. Such associations have not been explored in the published literature, but their potential existence must be considered.

While the physiological and cultural factors associated with HIV, infant feeding and maternal death are incompletely understood, the association between infant mortality and maternal mortality is well established. Therefore, when developing recommendations for infant feeding in complex humanitarian crises, the health and well-being of the mother must be considered. Minimisation of stigma and discrimination, the psychological benefits associated with infant attachment and the association of breastfeeding with birth spacing are all sound potential reasons to advocate breastfeeding even among HIV-positive women. While these factors may be considered 'soft indicators' in stable situations, in emergency settings these benefits may be crucial to maternal survival. Further research is needed to understand the significance of these factors and to compare the psychological benefits of breastfeeding with the potential detrimental feelings of guilt that some HIV-positive women may associate with breastfeeding. In addition, the economic costs associated with formula feeding warrant consideration; formula feeding may be more time and resource intensive, limiting resource availability for the mother's care for herself. This may also affect maternal morbidity and mortality.

Taking these factors into consideration, there is insufficient evidence to justify formula-feeding recommendations in complex emergencies from a maternal-health

perspective. An exception to this may be for women whose health restricts her ability to breastfeed, for example, women with AIDS-defining illnesses. Under such circumstances, provision of health-care and social support for the mother is fundamental. Formula feeding may be justified in circumstances when, despite health and social interventions, the mother remains unable to breastfeed her infant.

Infant health considerations

From an infant-health perspective, the balance of risks and benefits is relatively less complex. Recognising HIV-free survival as a primary end-point, infant-health considerations should be based on the balance of evidence, taking into account the circumstances in complex emergencies that differ from the conditions under which the studies were performed. If risk of HIV transmission or mortality from other causes is believed to be greater from breastfeeding, formula feeding may be advocated. If the benefits are deemed more significant, breastfeeding should be encouraged.

The realities of complex emergency settings limit the ability to extrapolate the findings of the infant-feeding study performed by Nduati and colleagues in Kenya. Unlike the study conditions, a clean water supply is less likely to be consistently present in complex emergencies, educators and health-care personnel are less likely to be able to provide close guidance to mothers, and a consistent, free supply of infant formula may not be present. A similar study, performed in a refugee camp setting, is needed before formula-feeding recommendations may be justified.

Framing the work by Coutsooudis et al. in contexts of humanitarian emergencies, reasons to advocate exclusive breastfeeding are clear. Given the potential for contaminated water supplies, mixed feeding protocols may increase HIV-transmission rates through inflammation and disruption of the gastrointestinal mucosa and increase the risk of all-cause mortality, particularly from diarrhoeal illnesses. Although further research is needed before recommendations about weaning practices and durations of exclusive breastfeeding can be made, the biological plausibility of Coutsooudis' results provides a reasonable rationale to educate all mothers, regardless of their HIV status, to avoid giving anything other than breast-milk to their infants during the breastfeeding period.

Having reviewed the literature published to date and considered the realities of humanitarian emergency environments, there seems little reason to advocate formula-feeding for infants whose mothers are alive and capable of breastfeeding. However, the population of infants who have been orphaned must also be considered. Under such circumstances, two alternatives remain: use of breast-milk substitutes or wet-nursing. From an infant-health perspective, wet-nursing may be considered the preferable option regardless of the women's HIV status, based on the reasons articulated above. However, the cultural acceptance of this practice and the metabolic demands on the breastfeeding woman must also be considered. In accordance with a 1998 UNICEF/UNAIDS/WHO review, wet-nursing is recommended only when considered culturally acceptable by family members who have undergone voluntary counselling and testing (VCT) and been found to be HIV negative. In the absence of these conditions, formula feeding may be advocated. Infant-care centres should be established to initiate formula feeding; in these controlled settings, resource and personnel availability may increase the likelihood of safe formula-feeding practices.

Fieldworker considerations

In complex humanitarian emergencies, both national and international field staff may significantly affect the health of displaced populations in a number of ways. Field staff, working on behalf of governmental organisations and NGOs, tangibly represent much-needed resources in situations of displacement. By extension, they may be perceived as community leaders in situations of community and cultural upheaval and contribute significantly to the establishment of norms in displaced settings. The beliefs and behaviour of field staff are noted by vulnerable populations and may contribute to changes in the behaviour of displaced individuals. It is therefore important that field staff be clear on the determinants of infant health and the best-practice guidelines for infant feeding.

The UNFPA/UNICEF/WHO/UNAIDS revised guidelines for infant feeding reflect the notion that different feeding practices may be preferable under different circumstances. Given the current state of knowledge about MTCT of HIV, these recommendations may be considered quite reasonable in stable resource-poor environments. However, there are a number of reasons why more explicit infant feeding guidelines may be warranted in complex emergencies. First, many international fieldworkers will be familiar with the Centers for Disease Control and Prevention guidelines (1985) that breastfeeding should be avoided by all HIV-positive women, the current standard of care in industrialised nations. Recognising the theory of cultural diffusion, one may hypothesise that this belief could be spread to all women in the absence of clear guidance to the contrary (Coutsoudis et al., 1999). The Silent Emergency Seminar held in 1999 by the British NGO AIDS Consortium Working Group on Emergencies and HIV/AIDS found that the majority of aid workers felt ill-prepared and inexperienced in dealing with HIV-related issues (Smith, 2002). Such feelings of inexperience may be countered by clear policy guidelines. The importance of developing clear policy statements and working with NGOs to institutionalise these policies in a coordinated manner is also supported by an assessment of infant-feeding practices during the Balkan crisis by Borrel and colleagues (2001).

The potential inadequacy of the UNFPA/UNICEF/WHO/UNAIDS current infant-feeding guidelines in emergency settings may be highlighted by reviewing the first of the revised recommendations: when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended. In the absence of these stipulations, exclusive breastfeeding is recommended. Individuals' or agencies' interpretations of this recommendation will depend on their perceptions of the acceptability of formula feeding, their beliefs about the duration of the crisis situation, their assessment of food security and their beliefs about the reliability of the food pipeline. The results of this analysis may vary among organisations, leading to varied infant-feeding recommendations and the propagation of mixed messages. Inconsistencies in the understanding of recommendations may have significant consequences; the 'spill-over' phenomenon may result in use of infant formula by HIV-negative women, significantly increasing the risk of infant mortality from diarrhoeal and respiratory illnesses. While there may be emergency situations in which use of breast-milk substitutes is acceptable, feasible, affordable, sustainable and safe, the establishment of more objective criteria may overcome some of the aforementioned differences in interpretation. Development and use of a field-oriented, policy decision-making tool may be beneficial to maximise health outcomes.

Ethical and resource-allocation issues

Having considered the risks and benefits of infant-feeding alternatives in complex emergencies within a framework of resource scarcity, a number of ethical considerations emerge. Significant research money has been allocated to investigate the pros and cons of early weaning, exclusive breastfeeding and use of infant formulas. The application of all such research requires that the HIV status of women be known, enabling them to make informed decisions about feeding choices. In reality, however, it has been estimated that less than 5 per cent of HIV-positive women are aware of their HIV status (Kapiga, pers. comm., 2003). The reasons for such low numbers are complex, but are undoubtedly related to the relative scarcity of voluntary counselling and testing (VCT) services, the paucity of anti-retroviral treatments and the stigma and discrimination associated with HIV. Scarce, even in stable resource-poor environments, VCT and treatment services are rarer in refugee environments. Lack of knowledge may perpetuate stigma and discrimination, making choices between infant feeding alternatives ineffectual. Arguing that greater resources should be allocated for HIV surveillance and testing, Khaw et al. (2000) articulate the ethical dilemma, 'Undoubtedly the ethical concerns regarding confidentiality, stigmatization and the potential for misuse of information must be dealt with sensitively ... Continuing to miss opportunities for prevention of HIV/AIDS in emergencies, however, represents a far greater ethical concern'. Prevention of MTCT of HIV requires that sustained efforts be made to educate women about their risks, and to protect women from sexual abuse and economic vulnerability in crisis situations. Education, prevention and protection efforts may increase maternal survival and reduce maternal HIV prevalence, resulting in improved outcomes for infants.

Among women whose HIV status is known, ethical dilemmas also underlie the breastfeeding/formula-feeding discussion. If the latter option is chosen to reduce the risk of post-natal HIV transmission, financial resources are required to purchase formula and feeding equipment. Estimates of how much it costs for six months of infant formula in less-developed nations range from \$50 in Brazil (Farley et al., 2000) to \$300 in Kenya (Nduati et al., 2000). Using Nduati's study of infants born to HIV-positive mothers as a guide, an HIV-free survival rate of 70 per cent at 24 months may be expected in formula-fed infants. (In reality, mortality rates may be significantly higher in complex-emergency situations.) This is in contrast to an HIV-free survival rate of 58 per cent in the breastfed group and represents a 12 per cent increased likelihood of survival for a mean formula cost of \$175. Given the costs of anti-retroviral therapies in comparison, financial resources may be better allocated to short-course intra-partum or post-partum anti-retroviral treatment. The most practical and least expensive protocol involves administration of a single dose of nevirapine to the mother at the outset of labour and a single dose to the infant post-partum. This regime is associated with a risk reduction of 47 per cent at 14 to 16 weeks for an estimated cost of \$4 (Guay et al., 1999). While issues of drug resistance need to be considered, studies suggest that nevirapine-resistant virus is unlikely to be passed from women to other sexual partners and that the efficacy of nevirapine in subsequent pregnancies is unlikely to be compromised (Farley et al., 2000). Administration of ARV therapy to mothers or infants during breastfeeding is currently being explored; such strategies may increase HIV-free survival rates to as significant a degree as formula feeding.

Recognising these price differentials and the additional risks of formula feeding in complex-emergency settings, it seems reasonable to advocate that financial resources to be directed towards anti-retroviral treatments instead of infant formula.

Increased availability of ARVs may prompt more women to seek HIV testing and foster an environment of openness and stigma reduction — a fundamental and primary goal in all HIV initiatives.

Clearly, the ethical issues are complex and do not preclude the need for clear infant-feeding policies in complex-emergency settings. However, in upholding infant and maternal survival as primary endpoints, all aspects of HIV prevention and treatment need to be broadly considered.

Conclusions

HIV/AIDS is a major challenge in complex humanitarian emergencies and infant-feeding recommendations must reflect the economic, social and environmental realities of these settings. Taking into consideration the requests of humanitarian field staff for guidance in dealing with HIV-associated issues (Smith, 2002) and past examples of poor infant-feeding practices in the absence of consistent policy institutionalisation (Borrel et al., 2000), the UNFPA/UNICEF/WHO/UNAIDS Inter-agency Task Team on Mother-to-child Transmission recommendations for infant feeding may be insufficient for establishing feeding policy during initial emergency stages. Given the current knowledge of post-natal HIV transmission and of factors influencing maternal and infant mortality in complex emergency settings, the policy decision-making framework for infant feeding in complex humanitarian emergencies (see Figure 1) is proposed. This framework incorporates objective criteria by which to assess the potential safety and suitability of breast-milk substitutes and may be readily applied in most field settings. While the recommendations intrinsic to the framework do not differ significantly from the UNFPA/UNICEF/WHO/UNAIDS infant-feeding

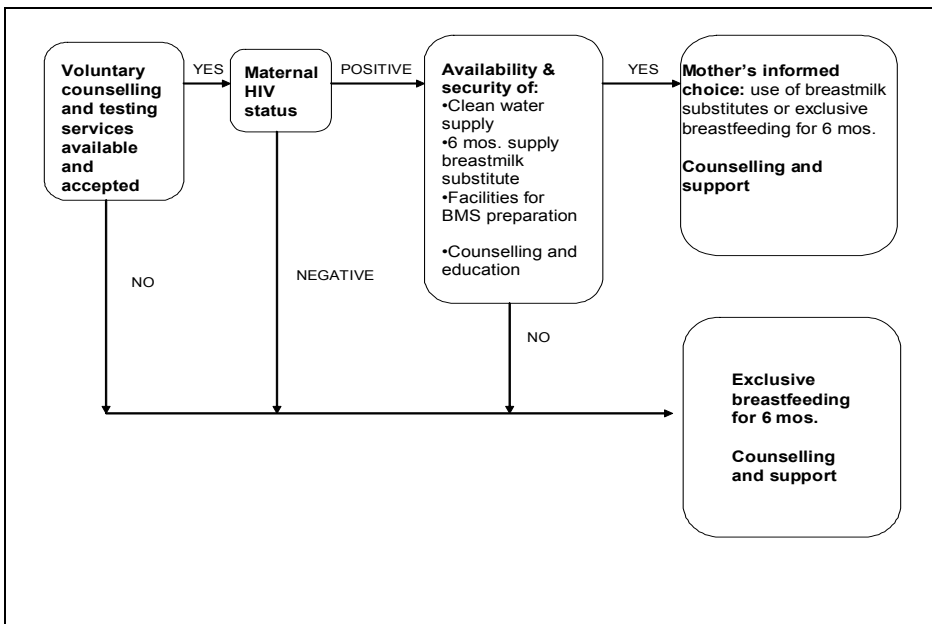


Figure 1 Policy decision-making framework for infant feeding to six months in complex humanitarian emergencies

recommendations in principle, the framework does provide more concrete guidance and objective criteria for policy development. Key recommendations for infant-feeding policy are discussed:

- Exclusive breastfeeding for six months, in conjunction with counselling and support, is the policy recommendation of choice in the vast majority of circumstances. Education campaigns should encourage all women to avoid giving their infants any water, herbal teas or other breast-milk substitutes. The recommendation for exclusive feeding for six months is consistent with the WHO Global Strategy for Infant and Young Child Feeding (2001) as well as UNICEF's Infant Feeding and Mother-to-child Transmission of HIV Technical Guidance Note (July 2002). It is based, in part, on the knowledge that use of breastmilk substitutes is associated with significant morbidity and mortality from infectious diseases, especially diarrhoeal diseases. The benefits of exclusive breastfeeding are highlighted in the aforementioned studies by Coutsoudis et al.
- Complementary foods may be introduced after six months of age. Breastfeeding may continue to provide some nutrition until two years of age or beyond. While Coutsoudis et al. suggest that abrupt weaning of breastfeeding with the introduction of complementary foods may reduce the risk of disease transmission in HIV-positive women, further research is needed before this recommendation can be endorsed in disaster situations.
- The UNFPA/UNICEF/WHO/UNAIDS Task Team on Mother-to-child Transmission (2000) recommended that breast-milk substitutes be used by HIV-positive women when their acceptability, feasibility, affordability, sustainability and safety could be established. The proposed framework goes a step further by suggesting objective means by which to meet this recommendation in emergency settings. Required prerequisites include access to and security of a clean water supply, a six-month supply of infant formula, facilities for formula preparation and counselling and education services. All four criteria should be ensured before formula use is considered. The terms acceptable, feasible, affordable, sustainable, and safe have been excluded from the framework as they are open to significant interpretation. Confidence regarding the long-term security of the food pipeline and of the water supply may be a significant challenge in many disasters, particularly during the initial phases. With regards to assurance of a clean water supply, application of the Sphere Project guidelines for water quality may be looked to for key indicators (Sphere Project, forthcoming). It is important to note that the Sphere guidelines state that adequate water quantity is more important than water quality in the early phases of a disaster. Use of breast-milk substitutes should be considered only when both water quantity and quality can be ensured. In the absence of these criteria, exclusive breastfeeding is recommended.
- When the aforementioned prerequisites for breast-milk substitute use have been met, HIV-positive women should be given the opportunity to make an informed choice between breastfeeding and breast-milk substitutes. This choice should be free from coercion from both professional and community influences. The assurance of both maternal and infant security is intrinsic to this; efforts should be made at all stages of complex humanitarian emergencies to promote safety and security. Attempts to reduce the stigma and discrimination surrounding HIV/AIDS and to protect women from physical and economic vulnerability should also be prioritised.

- Throughout most resource-poor nations, the vast majority of women are unaware of their HIV status. Therefore, establishment of VCT services may be necessary before women are able to make informed choices regarding infant feeding. In the absence of VCT services, all women should be encouraged to breastfeed. This recommendation is consistent with the Sphere Project's Humanitarian Charter and Minimum Standards in Disaster Response (forthcoming).
- HIV-infected women should have access to information, clinical care, nutritional support and, whenever feasible, anti-retroviral therapy to minimise mother-to-child transmission. Breast-health programmes should be established and all breastfeeding mothers should be educated to seek treatment for breast abscesses and clinical mastitis. All mothers should be taught to breastfeed using appropriate techniques.
- Infants of mothers who are unable to breastfeed due to AIDS-defining illnesses or for other reasons should be provided with close clinical care and social support. Relactation should be encouraged whenever possible or applicable. Formula feeding may be established if the mother's inability to breastfeed persists, ensuring that clean water, supplies and support are consistently available.
- Separate policies should be established for infants who have been orphaned. Wet-nursing by a family member may be considered if the family member has undergone VCT and is HIV-negative, and if the practice is deemed culturally acceptable. In the absence of these circumstances, formula feeding may be established.

The development of infant-feeding recommendations in complex humanitarian emergencies is difficult given the incomplete understanding of factors influencing postnatal transmission of HIV, the discrimination and stigma associated with HIV/AIDS in situations where women are already vulnerable and the resource scarcity and food pipeline insecurity associated with many complex emergencies. As the understanding of mother-to-child transmission of HIV continues to grow and treatment alternatives become available, the aforementioned recommendations may need revision. In the interim, consistent policy development and application is fundamental. Infant-feeding recommendations should be communicated to all organisations involved in disaster management and plans to institutionalise the recommendations should be established and upheld.

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