

# UPDATE: INFANT AND YOUNG CHILD FEEDING PRACTICES IN THE CONTEXT OF HIV/AIDS IN RWANDA

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## I. INTRODUCTION

The purpose of this document is to provide an update on the "Evaluation des pratiques d'alimentation des nourrissons et des jeunes enfants dans le contexte du VIH/SIDA au Rwanda" [1], a study on HIV and infant feeding conducted in Rwanda in 2005. The document discusses the results of the Rwanda study in light of more recent research and program findings since that work was carried out. The document is supplemented with the new WHO Guidelines on HIV and Infant Feeding, which were published in October 2006 and are attached in their entirety here [2].

The evaluation is a study commissioned by UNICEF, TRAC and the Nutrition Working Group. In this joint endeavor, TRAC was responsible for involving district authorities and health center staff, and for assisting in coordinating the study. Jumapili Rwahungu and I were recruited by UNICEF as consultants for the study. UNICEF also provided funding, logistical support, and technical and organizational oversight. The Nutrition Working Group reviewed the study protocol that we developed and was responsible for ensuring that the results of the study were included in the country's nutrition policy.

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In the document, I begin by describing the problem of Mother-To-Child Transmission (MTCT) and the challenges for the Prevention of MTCT (PMTCT) in Rwanda. I describe the design of the Rwanda evaluation and present the results as follows:

- a) Infant feeding choices made by mothers participating in the Rwanda PMTC program.*
- b) Breastfeeding cessation*
- c) Infant feeding counseling*

I conclude by discussing the Rwanda results in light of recent research on HIV and infant feeding.

## II. BACKGROUND

### **1. Risk of Mother-To-Child Transmission (MTCT) of HIV**

By 2006, more than two million children under the age of 15 were HIV-infected [3]. Over 80% of the world's HIV-infected children live in sub-Saharan Africa [3]. MTCT accounts for the majority of HIV infection in children. Without any interventions (such as ARV prophylaxis), about two-thirds of MTCT occurs during pregnancy or at delivery, and about one-third through unsafe breastfeeding practices [4]. The risk of MTCT through breast milk can be reduced if HIV-

infected mothers exclusively breastfeed their infants for the first six months of life, if breast health problems are avoided or promptly treated, and if women who are treatment-eligible receive ARVs [5-7]. Replacement feeding, or avoiding breastfeeding altogether from birth, is also an option for HIV-positive women, however, this is often neither a feasible nor a safe option in resource-poor settings, where the risks of infant morbidity and mortality when infants are not breastfed may outweigh the advantages of escaping the risk of HIV infection [2, 7-9]. Furthermore, in these environments, the social stigma associated with not breastfeeding makes it difficult for most mothers not to breastfeed, at least in public [10], increasing the risk that they mixed feed their infants, which is particularly risky in the first six months of life [5, 6, 11].

## **2. PMTCT in Rwanda: Successes and Challenges**

By 2005, over 50% of the 386 health care facilities in Rwanda were providing PMTCT services to women. Specific services varied, but they included HIV counseling and testing for women during pregnancy and, for those found to be HIV-positive, a single dose of nevirapine during delivery (for the mother and for her infant), as well as an infant HIV-test at 15 months. While universal coverage is anticipated by 2008, the program has experienced a number of challenges. For example, despite the high acceptance of HIV testing (more than 80% of pregnant women are tested), health staff in 2005 did not feel adequately prepared to address questions related to HIV and infant feeding. This may have been due to lack of training; by 2005, those counselors who had been trained in HIV and infant feeding had only received a two-hour module devoted to the topic. No nationwide training program designed specifically to address this aspect of PMTCT has yet been initiated in Rwanda.

### **III. EVALUATION OF INFANT FEEDING PRACTICES IN RWANDA**

#### **1. Study Design and Methods**

Three PMTCT sites were randomly selected from each of the 12 provinces in the country. All available HIV-positive mothers participating in selected PMTCT centers at the time of visits were surveyed. As criteria for eligibility, the mothers had to be HIV-positive and to have an infant under 18 months of age. In addition to interviews with the mothers, “open-ended” interviews were conducted with counselors participating in the PMTCT centers and “focus group discussions” were held with a sample of HIV negative mothers with infants under 18 months of age in the same sites. All quantitative survey data were analyzed using the SPSS 15.0 software. Qualitative data were coded and analyzed using the thematic, grounded approach.

#### **2. Study Results**

##### *a) Infant Feeding Choices*

Eighty-one percent of the HIV-positive mothers chose to breastfeed their infants. Of these, 53% justified their choice by explaining that they lacked the financial means to make other choices. Twenty percent noted that they found breastfeeding to be “easy.” It is important to note that *exclusive breastfeeding is by far the norm in Rwanda, where nearly 80% of all mothers practice exclusive breastfeeding in the first six months of life. This is the highest rate of exclusive breastfeeding both in Africa and in the world [12].* Forty-three percent of the mothers were still breastfeeding their infants at the time of the interview. The mean age of infants who were still being breastfed was 6±4.5 months. Breastfeeding was exclusive for 70% of these breastfed infants. We found no significant association between expressing negative beliefs about exclusive

breastfeeding (such as beliefs that breast milk does not contain water) and actually practicing exclusive breastfeeding. For example, of those who did not breastfeed exclusively, 11% believed their breast milk was insufficient. A similar proportion (13%) of exclusive breastfeeders reported the same belief.

*b) Cessation of breastfeeding*

Fifty percent of the HIV-positive mothers thought that infants should be taken off the breast at six months of age, and 43% thought that was possible at ten months or older, which was the oldest response category in the survey. One-fourth of the mothers (26%) believed that either a new pregnancy or resuming menstrual periods was the most important motivation for stopping breastfeeding (Appendix 1).

*c) Infant Feeding Counseling*

Ninety-three percent of mothers recalled receiving some information about breastfeeding from their PMTCT counselors. However, the quality of the information was inconsistent. With respect to other infant feeding options, only 40% of the mothers had heard of infant formula and 33% had heard of cow's milk. Seventeen percent of the mothers both felt that they should not breastfeed and had not received any information about a suitable breast milk substitute. In the focus group discussions, we observed differences in knowledge, attitudes and beliefs among counselors in the PMTCT sites. Some counselors noted that they had never been trained to advise mothers on infant and young child feeding. We also noted that professional motivation differed greatly from one PMTCT site to the other, reflecting variability in the perks and salaries offered to the counselors.

#### IV. DISCUSSION: CONTEXTUALIZING THE RWANDA STUDY RESULTS

Three chronological levels are useful in situating the results of the Rwanda study within recent epidemiological research on HIV and infant feeding. The first level is the infant feeding decision that the mother makes, ideally in an informed manner with a skilled counselor prior to delivery. The second is the actual pattern in which she feeds her infant postpartum. This pattern can be defined as: "exclusive breastfeeding," if the infant receives breast milk only and, with the exception of medical prescriptions, does not receive water; "mixed feeding," if the infant receives breast milk, and other fluids and solids; or "replacement feeding," if the infant is exclusively fed a breast milk substitute (i.e., does not breastfeed at all). Mixed feeding is often further subdivided into: "partial," if milk (including commercial breast milk substitutes) or semi-solid food is given in addition to breast milk; or "predominant," if the mother only gives other fluids [13]. However, to date, with the exception of the ZVITAMBO study in Harare [11] and the still unpublished vertical transmission study in Durban, investigations on HIV and breastfeeding have considered "mixed feeding" as one category. The third level is the time at which the mother ceases to breastfeed her infant. At each of these chronological levels, the infant outcome of interest, where it can be measured, is HIV-free survival. Some studies use HIV infection and malnutrition, illness due to infectious diseases other than HIV, hospitalization, or mortality in infant and young children as proxy indicators.

##### **1. Type of Infant Feeding Method (Any Breastfeeding vs. Replacement Feeding From Birth)**

At the time of the study, the global public health recommendation for HIV-infected mothers who choose to breastfeed was to breastfeed exclusively from birth for the first few months [14]. Recent investigations confirm the soundness of this recommendation and further specify that exclusive breastfeeding for the first six months is preferable. With respect to diarrhea and acute respiratory infections, a study from Côte d'Ivoire showed less favorable outcomes by 24 months among infants who were replacement fed in comparison to those who were breastfed [15]. Estimated hazard ratios for formula feeding were 1.4 and 1.7 for diarrhea and acute respiratory infections, respectively. In that study, malnutrition and mortality were not significantly associated with the mode of infant feeding. There was no significant difference in infant survival by 12 and by 24 months with ARV prophylaxis. Similar findings were observed in Botswana by 18 months and with ARV prophylaxis [7]. Neither of these studies reported on relative rates of HIV-free survival if breastfeeding was exclusive.

Taken together, the two investigations indicate that when the mother is HIV-infected, *replacement feeding from birth does not improve HIV-survival compared to breastfeeding, even in a better-off African country such as Botswana*. Another study from South Africa [5] indicates that *if breastfeeding is exclusive there is a significant difference in cumulative mortality at three months* (6% in exclusive breastfeeding vs. 15% in replacement feeding).

Since mortality is estimated to be more than nine times higher for infected versus uninfected infants [8, 15, 16], it is important to assess the proportion of infants who are alive and HIV-negative at a given time point (i.e., “HIV-free survival”) [8]. In the Botswana study, there was no significant difference between breastfed and replacement fed infants when mothers received Highly Active Anti-Retroviral Therapy (HAART) and when zidovudine prophylaxis was provided to both mothers and infants [7]. Further confirming these results, the study from South Africa [5] did not show any significant differences in HIV-free survival between infants who were breastfed and those who were replacement fed (75% in both cases by six months of age).

In the UNICEF study we conducted in 2005 in Rwanda, various factors may have influenced some of the 81% of mothers who chose to breastfeed and the 70% who breastfed exclusively. These may include the stigma of replacement feeding in a predominantly breastfeeding culture, the common practice of exclusive breastfeeding in the general population, and the high cost of replacement feeding. This suggests that, since most mothers prefer breastfeeding, as the cost of ART decreases and as drugs become increasingly accessible in this part of the world, efforts should be directed to making breastfeeding “safer” in order to reduce the risk of postnatal transmission. It was reduced in the Botswana study when eligible mothers were put on HAART.

## **2. Pattern of Breastfeeding: Exclusive Breastfeeding vs. Mixed Feeding**

Several studies have shown that exclusive breastfeeding protects against postnatal transmission better than mixed feeding patterns [6] [11] [17]. Recent additional persuasive evidence supports the advice to breastfeed exclusively for the first six months [5]. Infants fed solid foods in addition to breast milk were at higher risk of HIV transmission than those fed infant formula and breast milk (hazard ratio of 10.87 vs. 1.82, respectively, compared to exclusive breastfeeding). In fact, in ZVITAMBO, the highest risk of transmission was observed in mothers who partially breastfed (thus primarily replacement fed their infants), compared to those who exclusively or predominantly breastfed their infants [11]. This finding is important because PMTCT services

often give the message on mixed feeding only to those women who choose to breastfeed, whereas it is equally or more important to stress in women who chose to replacement feed. Information provided to women who replacement feed could be phrased as follows: “Never, ever, even for social reasons, attempt to breastfeed your infant.”

With respect to the Rwanda study, our results draw attention to the *very high prevalence of exclusive breastfeeding in Rwanda*. We found no indication that mothers who mixed fed did so because they believed their breast milk was insufficient. This finding is encouraging. It suggests that we can achieve even higher rates of exclusive breastfeeding if mothers are educated about the need to avoid feeds other than breastmilk and, if they are supported, to have faith that their milk is adequate for their babies, even if their health and nutritional status are less than ideal.

### **3. Use of Cow’s Milk as a Replacement Feed Prior to Six Months of Age**

At the time the Rwanda study was conducted, cow’s milk was considered an acceptable replacement food for infants who were being exclusively replacement fed. Because of cow’s milk lower concentrations of iron, vitamin A, vitamin C and folic acid, infants fed with cow’s milk had to be supplemented with these and other micronutrients. Modification of cow’s milk for infant consumption would have included dilution with water (to reduce its greater concentration in protein, sodium, phosphorous and other salts) and the addition of sugar (to compensate for the energy lost during dilution).

Since the Rwanda study was done, home-modified formula made from cow milk is no longer advised by the WHO as a replacement feeding option for mothers who choose to avoid breastfeeding from birth or to stop before the infant is six months of age. Reasons for this change include the difficulty of accessing the supplementary micronutrients required for the infant, and the difficulty of safe and appropriate modification of cow’s milk. However, cow’s milk is crucial for older infants once breastfeeding stops, if a suitable commercial breast milk substitute is not accessible or affordable. At these older ages, cow’s milk is easier for the infant to digest and no longer causes gastrointestinal bleeding, which leads to iron deficiency anemia.

### **4. Cessation of Breastfeeding**

Early cessation of breastfeeding (prior to six months) was previously believed to be the safest alternative for HIV-positive mothers [18]. Because of concerns about the increased risk of postnatal transmission due to mixed feeding in comparison to exclusive breastfeeding, the “period of transition” was to be “kept as short as possible.” This [19] formed the basis for the practice of cessation at or before six months of age (“early”) and over a short period of time (“rapidly” or “abruptly”). Early breastfeeding cessation (before or at six months) has recently been shown to lead to worse overall outcomes (increased mortality, decreased rates of HIV free survival) compared to longer periods of breastfeeding [20], [21]. Gastroenteritis was also more frequent [21], even when infants were given ARV prophylaxis [22]. Controlling for HIV-status and when all mothers received HAART, early cessation led to higher mortality in infants and young children [23]. The ZEBS study found no significant differences in HIV-free survival between a group of mothers who had been randomized to advice to stop breastfeeding at four months and a group that continued breastfeeding as long as they wanted to [24]. Thirty five percent of the mothers assigned to stop breastfeeding at four months did not comply with the advice, and continued breastfeeding. An analysis based on actual practice (regardless of the

group to which mothers had been randomized) also showed no significant difference in HIV-free survival for early versus late weaning.

Since higher levels of cell-free HIV in breast milk are associated with a higher risk of postnatal transmission [25], viral loads can be used as a surrogate marker to assess the risk of postnatal transmission. Levels of virus in breast milk were found to be almost ten times higher in women who were trying to stop breastfeeding rapidly, in comparison to those who were intending to continue breastfeeding in the Zambia study [9]. This finding suggests that abrupt cessation, also an earlier recommendation, may not be advisable.

Based on these recent findings, early and abrupt breastfeeding cessation is no longer recommended. According to a WHO consensus statement [2], “At six months, if replacement feeding is still not acceptable, feasible, affordable, sustainable and safe, continuation of breastfeeding with additional complementary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.”

We found that mothers in Rwanda lacked funds to purchase infant foods that would be adequately nutritious to replace breast milk. This indicates the potential value of supporting mothers when complementary feeding begins and the crucial importance of doing so when breastfeeding ends. Support could involve providing some of the ingredients needed for preparing foods for the infant, as well as fuel and other equipment. The new WHO guidance specifies that if foods are provided for replacement fed infants or for those who stop breastfeeding, an equivalent should be provided to those who continue to breastfeed so as not to coerce women towards one option. Of course, the long-term solution would be to build mothers’ capacity to purchase high-quality complementary feeds by improving their financial situation. For example, creating associations for HIV-infected mothers which promote income generating activities, such as the Health Center in Gihundwe funded by UNICEF, in which members are involved in income generating activities such as making soap and weaving baskets.

## **5. Infant Feeding Counseling**

While the success of PMTCT sites depends on their ability to help mothers make informed decisions and then to implement them, counselors at the time of the study were not adequately prepared for this task. The finding that some mothers had heard that they should not breastfeed, but they had not received any information about a suitable breast milk substitute, highlights the lack of training of counselors in Rwanda. With regard to the safety of replacement foods, we found that mothers lacked knowledge about their preparation. Clearly, there is an urgent need for a comprehensive curriculum on infant feeding for counselors in Rwanda.

In particular, if, in congruence with the new WHO guidance, mothers are to be assisted in deciding when to stop breastfeeding sometime between six and 24 months rather than being told to do so at exactly six months of age, then infant feeding counselors will need to be trained in doing postnatal assessment of whether replacement feeding is AFASS at various points postpartum beginning at six months. Unlike AFASS evaluation done prenatally, this postnatal AFASS assessment can also take the mother’s health status into account.

In training health care providers on HIV and infant feeding, practitioners may consider partnering the older, more experienced sites with the recent ones. This will allow recent sites to learn from the more experienced ones. Another approach is to have a core group of highly trained trainers who would go around to the sites. This would guarantee that training is standardized across sites and ensure that spin-off training sessions are accurate.

There should also be improved collaboration among PMTCT site partners. Improved collaboration would have the following benefits: a) the training provided to health care providers could be standardized; b) it would avoid variability in professional motivation as PMTCT partners would standardize the salaries and perks offered to counselors and personnel; c) it would allow a standardized package of services to be offered to mothers at all the PMTCT sites. For example, rather than offering replacement foods in some sites and not in others, foods would be offered to all eligible mothers, regardless their enrollment site and regardless of their infant feeding decision.

Appendix 1: Most important motivation for Stopping Breastfeeding\*

<b>Most important motivation for Stopping Breastfeeding</b>	<b>Frequency</b>	<b>%</b>
When the infant begins to speak	40	6%
When the infant begins to walk	23	3%
When the infant refuses breast milk	103	15%
If the mother becomes pregnant again	147	22%
If the infant begins to teethe	32	5%
If the infant begins to want to eat with other adults	142	21%
Six months after birth	74	11%
When the mother begins to have her menstrual period	25	4%
Other reasons	96	14%
<b>Total</b>	<b>682</b>	<b>100%</b>

\*Mothers could only choose one option. However, it is not inconceivable that a number of “events” could culminate in her decision to stop breastfeeding. For example, an infant could begin to lose interest in breast milk around the same time that the mother realizes she is pregnant. This would lead to her decision to terminate breastfeeding.

This paper can also be found on: <http://www.path.org/publications/publications>

## References

1. Thairu, L. and Rwahungu, J., *Evaluation des pratiques d'alimentation des nourrissons et des jeunes enfants dans le contexte du VIH/SIDA au Rwanda*. 2005, UNICEF: Kigali.
2. WHO, *WHO HIV and Infant Feeding Technical Consultation Held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants* 2006: Geneva.
3. UNICEF, UNAIDS and WHO, *Children and AIDS: A Stocktaking Report Actions and progress during the first year of Unite for Children, Unite against AIDS*. 2007. p. 1-44.
4. Coutoudis, A., et al., *Late postnatal transmission of HIV-1 in breast-fed children: an individual patient data meta-analysis*. J Infect Dis, 2004. **189**(12): p. 2154-66.
5. Coovadia, H.M., et al., *Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study*. Lancet, 2007. **369**(9567): p. 1107-16.
6. Coutoudis, A., et al., *Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study*. South African Vitamin A Study Group. Lancet., 1999. **354**(9177): p. 471-6.
7. Thior, I., et al., *Breastfeeding plus infant zidovudine prophylaxis for 6 months vs formula feeding plus infant zidovudine for 1 month to reduce mother-to-child HIV transmission in Botswana: a randomized trial: the Mashai Study*. Jama., 2006. **296**(7): p. 794-805.
8. Nduati, R., et al., *Effect of breastfeeding and formula feeding on transmission of HIV-1: a randomized clinical trial*. Jama, 2000. **283**(9): p. 1167-74.
9. Thea, D.M., et al., *Post-weaning breast milk HIV-1 viral load, blood prolactin levels and breast milk volume*. Aids., 2006. **20**(11): p. 1539-47.
10. Thairu, L.N., et al., *Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa*. Matern Child Nutr., 2005. **1**(1): p. 2-10.
11. Iliff, P.J., et al., *Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival*. Aids., 2005. **19**(7): p. 699-708.
12. Mukuria AG, Kothari MT, Abderrahim N, *Infant and Young Child Feeding Update*. 2006, USAID: Washington, DC.
13. Labbok, M. and Krasovec K., *Toward consistency in breastfeeding definitions*. Stud Fam Plann, 1990. **21**(4): p. 226-30.
14. WHO, *New Data on the Prevention of Mother-To-Child Transmission of HIV/AIDS and their implications: Technical consultation UNFPA/UNICEF/WHO/UNAIDS Inter-Agency Team - Conclusions and recommendations*. 2001. p. 1-38.
15. Becquet, R., et al., *Two-Year Morbidity-Mortality and Alternatives to Prolonged Breast-Feeding among Children Born to HIV-Infected Mothers in Côte d'Ivoire*. PLoS Med, 2007. **4**(1): p. e17.



16. Mbori-Ngacha, D., et al., *Morbidity and mortality in breastfed and formula-fed infants of HIV-1-infected women: A randomized clinical trial*. Jama., 2001. **286**(19): p. 2413-20.
17. Magoni, M., et al., *Mode of infant feeding and HIV infection in children in a program for prevention of mother-to-child transmission in Uganda*. Aids., 2005. **19**(4): p. 433-7.
18. Kuhn, L. and Z. Stein, *Infant survival, HIV infection, and feeding alternatives in less-developed countries*. Am J Public Health, 1997. **87**(6): p. 926-31.
19. UNICEF, U.a.W., *HIV and Infant Feeding: A Policy Statement developed collaboratively by UNAIDS, UNICEF and WHO*. 1997.
20. Athena Kourtis, D.F., L Hyde, H C Tien, C Chavula, N Mumba, M Magawa, R Knight, C Chasela, C van der Horst, and the BAN Study Team *Diarrhea in Uninfected Infants of HIV-infected Mothers Who Stop Breastfeeding at 6 Months: The BAN Study Experience*, in *Fourteenth Conference on Retroviruses and Opportunistic Infections (CROI)*. 2007: Los Angeles.
21. Onyango C, M.F., Bagenda D, Mubiru M , Musoke P , Fowler M , Jackson J, and L Guay, *Early Breastfeeding Cessation among HIV-exposed Negative Infants and Risk of Serious Gastroenteritis: Findings from a Perinatal Prevention Trial in Kampala, Uganda*, in *Fourteenth Conference on Retroviruses and Opportunistic Infections (CROI)*. 2007: Los Angeles.
22. Kafulafula G, T.M., Hoover D, Li Q, Kumwenda N, MipandoL, Taha T, Mofenson L, and Fowler M, *Post-weaning Gastroenteritis and Mortality in HIV-uninfected African Infants Receiving Antiretroviral Prophylaxis to Prevent MTCT of HIV-1*, in *Fourteenth Conference on Retroviruses and Opportunistic Infections (CROI)*. 2007: Los Angeles.
23. Homsy, J., Moore, D., Barasa, A., Mermin, J, *Mother-to-Child HIV Transmission and Infant Mortality Among Women Receiving Highly Active Antiretroviral Therapy (HAART) in Rural Uganda*, in *The President's Emergency Plan for AIDS Relief Annual Meeting. The 2006 HIV/AIDS Implementers' Meeting. Building on Success: Ensuring Long-Term Solutions*. 2006: Durban, South Africa.
24. Sinkala M., et al., *No Benefit of Early Cessation of Breastfeeding at 4 Months on HIV-free Survival of Infants Born to HIV-infected Mothers in Zambia: The Zambia Exclusive Breastfeeding Study*, in *Fourteenth Conference on Retroviruses and Opportunistic Infections (CROI)*. 2007: Los Angeles.
25. Roussea C., et al., *Association of Levels of HIV-1–Infected Breast Milk Cells and Risk of Mother-to-Child Transmission*. Journal of Infectious Diseases, 2004. **188**0(190): p. 1880-1888.

This paper can also be found on: <http://www.path.org/publications/publications>

## ACRONYMS

AFASS	Acceptable, feasible, affordable, sustainable and safe
ARV	Antiretroviral therapy
HAART	Highly active antiretroviral therapy
HIV	Human immunodeficiency virus
MTCT	Mother-to-child transmission of HIV
PATH	Program for Appropriate Technology in Health
PMTCT	Prevention of mother-to-child transmission of HIV
TRAC	Treatment and Research AIDS Center
UNICEF	United Nation's Children's Fund
WHO	World Health Organization
ZEBS	Zambia Exclusive Breastfeeding Study
ZVITAMBO	Zimbabwe Vitamin A for Mothers and Babies Project