

**NDOLA DEMONSTRATION PROJECT TO
INTEGRATE INFANT FEEDING COUNSELLING AND HIV
VOLUNTARY COUNSELLING AND TESTING INTO HEALTH
CARE AND COMMUNITY SERVICES**

HIV AND INFANT FEEDING

**A summary of the findings and recommendations from the formative research
carried out in Lubuto, Main Masala, Twapia and Kabushi Health Center areas
Ndola, Zambia**

December 7-9, 1998
January 30-February 3, 1999

National Food and Nutrition Commission
Ndola District Health Management Team
LINKAGES
SARA

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FOREWORD

HIV and AIDS are relatively familiar terms in the vocabulary of most Zambians. This scourge has touched most families either directly or indirectly via illness or the death of a distant or close relation.

Mother-to-child transmission (MTCT) of the AIDS virus is a relatively new concept in most of our population. The fact that breastfeeding now seems to be a play a contributory role in the transmission of the virus seems to be a major stumbling block to most interventions that districts are putting in place to fight the spread of the HIV. Our current policies and strategies do not give direction to our health providers for counselling pregnant women either before HIV-testing or following a positive HIV-test result. Mother and child nutrition has not been a part of our HIV voluntary counselling and testing (VCT) programs, but should be considered, especially among pregnant and post-natal women.

This formative research report addresses the pertinent issues of household food security, infant feeding, and the stigma associated with HIV/AIDS in the community. The report provides suggestions on how a poor mother can adequately feed her baby in the face of HIV in the home. The results of this research can be used a basis for defining and targeting our MTCT interventions, which we have begun to promote but have had little concrete data from the community to support and inform them.

I am privileged to have been part of the group that worked tirelessly to plan and carry out this research. The Ndola Demonstration Project has used a participatory and inclusive process in all its stages of operation and this is not always been an easy thing to do. May I therefore take this opportunity to acknowledge the effort of our partners for giving us the necessary encouragement and the financial muscle for us to carry out this work. I would also like to commend the District Health Management Team (DHMT), of which I am part, and the District Health Board for allowing this work to be done in their areas of operation. It is my sincere hope that the findings and recommendations contained in this document will be utilized, not only by our districts, but also by our donors who sometimes prescribe interventions that may not be useful to the local communities.

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Introduction

This report summarizes the findings of the formative research on HIV and infant feeding that was carried out in the Lubuto, Main Masala, Twapia and Kabushi health centers and surrounding populations on December 7-9, 1998 and January 30-February 3, 1999. The purpose of the research was to develop locally appropriate and feasible infant feeding recommendations for HIV-positive mothers and families living with HIV in urban Zambia (Ndola). The information will be used to develop training, counselling, and educational materials for a project to integrate HIV voluntary counselling and testing, and improved infant feeding, into existing clinic services and community-based activities in Ndola District.

The research team consisted of members of the National Food and Nutrition Commission (NFNC); the Ndola District Health Management Team (DHMT); the nurses in charge of the Lubuto and Main Masala Health Centers; and the LINKAGES and SARA Projects of the USAID. Team members are listed at the end of the report.

The research included:

- Two focus group discussions with mothers of children < two years of age
- Two focus group discussions with fathers of children < two years of age
- One focus group discussion with HIV-positive men
- One focus group discussion with HIV-positive women
- 33 semi-structured key informant interviews with mothers of children < two years, mothers' support group members, and members of the neighbourhood health committee
- 22 semi-structured key informant interviews with health providers in the health centers listed above
- Six semi-structured key informant interviews with traditional birth attendants working in the committees and/or health centers listed above
- One key informant interview with an experienced HIV counselor
- One key informant interview with a care giver at a Ndola orphan transit home
- 18 household interviews, including observation and cooking demonstrations, with care givers of children < two years of age
- 28 household trials of improved feeding and caring practices

The focus group discussions with HIV-positive members and the interview with the HIV counselor were held at Hope Humana, a Ndola-based NGO that provides HIV voluntary counselling and testing and organizes support groups for people with HIV/AIDS. All other field activities took place in the Lubuto, Masala, Twapia, and Kabushi health centers and surrounding residential areas.

The formative research included three phases:

- Phase one was an exploratory study of general awareness of HIV, mother-to-child transmission, and breastfeeding-related transmission issues. Health providers were also asked about their case management procedures and counselling-related practices. Other key informants were asked about their breastfeeding and complementary feeding practices.
- Phase two was a more detailed study of household food preparation, food availability, and hygiene and sanitation conditions. It also included an assessment of locally available replacement foods and breastmilk alternatives, and cooking and feeding demonstrations by care givers.
- Phase three included trials of specific infant formula and milk preparation practices, and possible replacement foods for older children. These trials were carried out in households. Proposed recommendations were also discussed with health providers and other key informants. During Phase 3, additional key informants (traditional birth attendants and mothers support group members) were also interviewed about their antenatal care, delivery, and counselling practices.

Issues studied in Phases 1 and 2

The issues studied in phases 1 and 2 are summarized below. Different methods were used to collect the same information and the findings across methods were compared. The information obtained was consistent across research methods, and therefore, the results are combined for this summary report.

The focus group discussions and key informant interviews with mothers and community members covered the following topics:

HIV issues:

- knowledge and awareness of HIV/AIDS and how it is spread
- familiarity with HIV testing and where to go for testing
- decision-making and willingness to be tested and finding out the results
- what they would do if they received a positive test result
- what others would do (family, spouse, partner) if the result was positive
- knowledge of mother-to-child transmission
- knowledge of HIV transmission through breastfeeding
- attitudes about HIV and breastfeeding
- perceived risk of HIV infection and mother-to-child transmission
- sources of information on HIV

Infant feeding issues:

- typical breastfeeding duration and reasons for early weaning
- women in the community who do not breastfeed
- problems that women face if they choose not to breastfeed

- problems and special needs of babies who are not breastfed
- caring and feeding of orphans < two years of age
- introduction of liquids, semisolid, and solid foods and related feeding practices
- characteristics of a healthy baby
- sources of information on infant feeding

The key informant interviews with health providers covered these topics:

HIV issues:

- knowledge and awareness of HIV/AIDS and how it is spread
- knowledge of mother-to-child transmission
- knowledge of HIV transmission through breastfeeding
- attitudes about HIV and breastfeeding

Infant feeding counselling and case management practices:

- current counselling about infant feeding
- advising women who choose not to breastfeed
- case loads and case management practices for antenatal and delivery care, family planning, and sick child care
- growth promotion and counselling women about their children's growth

The household interviews with observations and cooking demonstrations covered these topics:

- current breastfeeding practices (recorded and observed)
- purchasing, preparation, and feeding of nonhuman milk and thin porridge
- porridge or infant formula cooking demonstration and observation of feeding
- observations of household water availability, hygiene, and sanitation
- observations of child caring practices and child behavior
- foods available in the home, food storage, and food security
- household composition, home construction, and amenities

The market survey included information on the brands, sizes, prices, and quality (e.g., fortificants, packaging, expiration dates, etc.) of these items:

- infant formula
- liquid and powdered cows' milk
- soap
- sugar
- vitamins

Issues studied in Phase 3

The following information was collected during the household trials. Key informant interviews covered respondents' reactions to the recommended practices only.

Health status of the child

- birth date, birth weight
- growth pattern, weight-for-age, and reasons for growth faltering
- vitamin A supplementation history
- immunization history

Feeding practices

- 24-hour food recall
- measurements of the volumes and exact sizes of all feeding utensils
- breastfeeding practices, including expression of breastmilk
- purchasing, preparation, and feeding of infant formula and cows' milk
- availability and use of multivitamins

Home hygiene, sanitation, food availability

- sources of water, boiling practices
- availability and use of soap and other cleaning solutions
- availability of different foods, ingredients in the home
- regularity of income for purchasing food and periods of food insecurity

General opinions, willingness to try, and experience with the following feeding recommendations:

- cup-feeding during the day and night
- preparing and feeding infant formula
- preparing and feeding cows' milk (including boiling, and dilution with boiled water and addition of sugar for children less than six months)
- boiling water, sterilizing feeding utensils
- exclusive breastfeeding (for children less than six months)
- expressing breastmilk, boiling it (health providers only), and feeding it
- cooking with milk (for children older than six months)
- enriching porridge and *nshima*¹ with milk and different ingredients/foods (for children older than six months)
- increasing the frequency of feeding (for children older than six months)
- giving fruits and snacks
- increasing feeding (frequency, quantity, variety) during and after illness
- attending monthly weighing sessions

Summary of the major findings

¹Stiff maize-meal porridge.

General characteristics of the study population:

- Respondents ranged in age from 15 to 53 years old (median: 25 years). Mothers had between one and 11 living children (median: 3), although a few women were pregnant with their first baby. Most households contained one family living under the same roof, although several homes had more than one family present. Families tend to be extended, with 6-8 family members living together. It is not unusual for mothers to be living with their parents or other adults, and not with the fathers of their children.
- Respondents in the community are relatively well educated. Women had between 7-9 years of education in most cases, and some women had 12 or more years of schooling.
- Most women do not work outside the home, although trading, selling food (from home), working in the market, and selling other homemade goods was not uncommon. A few women interviewed were also teachers. Many households do not have any members who are regularly employed, although some households have multiple working members. Most workers are paid once per month and many families report running out of money for food by the end of the month.

HIV issues:

- There is a high level of awareness about HIV and how it is spread in this community. However, one's HIV status is a private matter that may be discussed within the family (e.g., with partners and parents), but not with others outside this unit (e.g., with friends or neighbors).
- There is a strong social stigma against people who are found to be HIV-positive and/or have AIDS-related symptoms, and there is little compassion outside the family for these conditions. Not all families, however, treat HIV-infected members with compassion and many have difficulty caring for sick patients.
- Many respondents, including the HIV-positives, felt that the stigma associated with HIV/AIDS is caused by the fear of people laughing at them. Women said that people will think they are prostitutes if they are HIV-positive. Some HIV-positive women wondered why the subject of HIV/AIDS is still not talked about openly since all families in the community have been affected by the pandemic.
- Although respondents appear willing to get tested, and many would encourage others in their family to get tested if they themselves were HIV-positive, there is relatively little demand for preventive testing to confirm a negative status, or to encourage people to protect themselves and/or change their lifestyle. Most women thought they were vulnerable to HIV-infection from their partner.
- The most common motivations for getting tested were to know your status, especially if you are suffering from prolonged illnesses like fever, malaria, and cough, and because

you suspect your spouse is “moving around” or not faithful. Respondents wanted testing services to be available for free in the community.

- It appears that most people equate testing positive for HIV with having AIDS (and don't recognize that the people with AIDS are the tips of an iceberg that includes a larger population of people who are HIV-positive). This perception should be explored further during the community assessment planned by the project.
- There is a great deal of fatalism about testing positive/having AIDS. Few people think there is anything that can be done once the positive test is received (except prepare for death, worry, and take medicine for illnesses). Several respondents said that people get depressed and try to kill themselves when they find out they are infected. Some men said that they would “lose control of their family” if they find out they are HIV-positive, and others worried about family members wanting to take their possessions. HIV-positive men and women felt that pre-test counselling is important for encouraging people to get tested. Post-test counselling helped these people to deal with depression (after finding out they were infected) and learn to live positively with the disease.
- Almost all the respondents said they would not want to have additional children if they found out they were HIV-positive. The reasons are because they would not want their babies to suffer from the disease or to grow up as orphans. Some women and men also said that if an infected woman gets pregnant it is likely to make her health status worsen, and she may die soon after. They said that family planning, and even sterilization, should be used to prevent pregnancy. However, this decision would require the involvement of men.

Mother-to-child transmission issues:

- There is a high level of awareness about mother-to-child transmission of HIV, but some misperceptions exist about modes of transmission. Health providers and HIV-positive respondents had more information about mother-to-child transmission than mothers and fathers of children less than two years old.
- Most mothers and fathers thought that HIV was transmitted during pregnancy and through breastfeeding. Transmission during delivery was infrequently mentioned. Women were believed to be at increased risk of transmitting HIV to their babies if they had sexual intercourse with an infected person while they were pregnant. The “blood present in breastmilk” was believed to be the source of infection through that route. As far as delivery is concerned, a few respondents mentioned blood exchange, and poor attention and care by the midwife at delivery, as causes of mother-to-child transmission.
- Health providers and traditional birth attendants reported several risk factors for mother-to-child transmission, including full-blown AIDS, exclusive breastfeeding, cracked nipples, oral thrush in the baby, HIV-positive status at the time of conception, and concurrent sexually transmitted diseases or tuberculosis.

- The risks due to breastfeeding are believed to be very high, and most men, women, and traditional birth attendants had the impression that all HIV-positive mothers pass the virus through breastmilk. Health providers and HIV-positive respondents felt that only some mothers passed on the virus, but few HIV-positive respondents knew of any risk factors for breastfeeding transmission.
- The main source of information about mother-to-child transmission is the health center, although general information about HIV is available through many channels (radio, television, schools, church, family and friends, etc.). A few respondents reported being told at a church-based training that HIV-positive women should not breastfeed.
- Respondents had conflicting views about whether mothers who are HIV positive should breastfeed. The economic hardship of not breastfeeding was recognized by many (particularly the health providers). However, all the HIV-positive men and women and many other informants felt that they would not breastfeed their babies if they were HIV-positive. Some respondents said that the decision to breastfeed would depend on the status of the baby at birth. If the baby was already infected, they would breastfeed, but if the baby was not infected they would choose not to place the infant at additional risk of HIV. It is not clear how they would determine the HIV status of the baby at the time of birth.

Breastfeeding and alternative feeding practices:

- The respondents interviewed had or reported many positive feeding practices. Mothers of young babies (< 3 months) reported exclusive breastfeeding; the others were still breastfeeding, and most breastfed on demand. Only one child in the entire sample was no longer breastfed because of his/her age (20 months). All other babies who were not breastfed were orphans.
- Breastfeeding is the norm in this community and women typically breastfeed for about 18-24 months. Water and light porridge are introduced early to young babies, some times as early as 2-3 months of age. The maize meal porridge is thickened as the child gets older to the age when *nshima* is fed (to babies older than 6-8 months). Babies who reach for food, cry often, or cry when they see food are thought to be ready to eat solid foods. Women stop breastfeeding early (before 18 months) because of illness; pregnancy; return to school or work; or because their babies do not want to eat other foods.
- Only a few women report the practice of expressing breastmilk. The reasons for expression are to relieve engorgement and to have milk for the young baby when the mother goes out for a short period and cannot bring the infant. Few women could demonstrate how to express breastmilk correctly. A few health workers were opposed to feeding babies expressed breastmilk because of a traditional belief that it might cause diarrhea and vomiting in the child (*icibele*).
- Women who do not breastfeed currently face a considerable social stigma in the community. If a woman does not breastfeed, people wonder why and suspect that she is

a prostitute, is engaging in promiscuous behavior, or is ill (with HIV usually). The decision not to breastfeed may anger other family members, and in some cases it may lead to spousal violence.

- Babies who are not breastfed are given infant formula (usually Lactogen) or cows' milk. Most are fed by cup, but feeding bottles are not uncommon. If supplies of milk run low, families may either dilute the formula or feed the baby thin maize meal porridge. Wet-nursing is no longer very common in this area according to most informants; fear of HIV is a commonly reported reason for its decline.
- Babies who are not breastfed are perceived to be at high risk of poor growth, health, and developmental problems. They are also believed to have special nutritional as well as psycho-social caring needs. If they are not breastfed because they are orphans (a condition believed by more than half of the respondents to be very common in the community), they are thought to be at high risk of dying.
- Orphans are usually cared for by family members, most often a grandmother or sister(s) of the deceased mother. Some care givers are unemployed or unable to work because of the responsibility of caring for the young child. If the father is still alive and has contact with the family, he may buy infant formula for the baby, but these contributions are often irregular. It appears that when the orphan is old enough for other foods, special milk and food purchases for the baby decline because the family cannot afford them. Some orphans consumed no milk at all, only porridge and *nshima*.
- There are few services outside the family to assist with the care and feeding of orphaned children. Even the orphan transit home depends on irregular contributions from well-intentioned citizens to buy infant formula, food, and medicines for the children living there.

Milk preparation practices

- In the household interviews, respondents reported frequent use of nonhuman milks, but this does not appear likely, given the amounts reportedly purchased; the fact that products were not observed in most homes; and the difficulty in finding respondents who were willing/able to demonstrate milk preparation. The quantities consumed are clearly not sufficient to nourish a young child who is not also breastfeeding. In fact, families reported buying between 1000-2000 g of formula/month (estimate), which is far below the amount need to formula feed a baby exclusively in the first 6 months (~ 3,350 g/month).
- Many respondents purchase formula at the Shoprite in Ndola. Tins are bought for two weeks to one month in 250 g or 500 g sizes (K 3000 and 5800, respectively in December). The price of Lactogen increased to K 7000 for 500 g in February (although the price of other brands remained the same). Bus fare is about K 1200 round-trip; it takes an hour or more to get to the store. The cost of a six-month supply of infant formula (not including bus fare and preparation related expenses) is about K 234,000

(\$106), assuming December prices.

- Many households reported that they did not have a regular source of income to buy food for the family. All respondents reported times (during the month) when they could not afford to buy formula.
- Unlike formula, fresh milk² is bought on a day to day basis and may be consumed by other family members. Fresh milk (heat-treated, long-life milk) costs about K 1000 for 500 ml and it is available in many of the local shops and kiosks. Powdered full-cream milk is comparable in price to infant formula and not commonly used for feeding babies.
- If fresh cows' milk is diluted for young children, sugar must also be added. Nearly all households had at least some sugar present (although quantities varied). The cost of feeding a baby diluted cows' milk with sugar for six months is about K 220,500 (\$100). When the cost of supplemental vitamins is included (about K 2000/month), the cost of milk-feeding for six months is about \$105 (assuming December prices). The cost of fuel is also not included in this calculation. The price of fresh cows' milk did not increase between December and February.
- Milk is fed in 150-200 ml cups and 240 ml feeding bottles. Some of these have gradations for marking different volumes. Some cups and bottles were clean and others were stained and dirty. It is possible for some households to clean things well (e.g., homes with inside taps, with toilets, that are neat and well-organized) but for the majority proper hygiene will be difficult. Care givers will save unfinished infant formula for later consumption (although proper refrigeration is not available). Excess cows' milk and other foods will be shared with other children in the family.
- Water is usually boiled before preparing the infant formula but cooking times vary. It takes about 10-15 minutes to bring water to a boil using the charcoal stoves (or electric plates) that are common in the area.

Porridge preparation practices

- Maize meal porridge is the food most commonly given to young children, and all but one baby in the household observation sample (<3 months old) was already eating it. Porridge is usually made with maize meal, water, salt, sugar, and groundnuts, if available. It is sometimes cooked with oil or butter, if these are available. Other ingredients, such as egg or *kapenta*³, may also be added to porridge, but relatively few families had these at the time of the household observation or trials first visit, and only three children reported consuming them during the 24-hour food recall. During the observations and trials, about half of the homes visited had very little food available, and a few had no food at all.

²Throughout this report, fresh milk and fresh cows' milk refers to processed and packaged milk and not milk that is fresh from the cow. Goats' milk and other animal milks were not common in this area.

³A small, sardine-like fish.

- Porridge is introduced early to supplement breastmilk because “breastmilk alone is not enough for the baby” and because the baby cries a lot. Some respondents felt that eating leftover porridge, however, causes diarrhea. Children continue eating porridge throughout the first year, even after *nshima* has been introduced.
- Tap water is boiled when making porridge, and most recipes take about 40 minutes to prepare. Respondents report preparing one serving at a time because storing foods is difficult in this environment. Serving sizes appeared to be about 200-250 ml, which is satisfactory for infants 6-12 months old, but is small for the older children (capable of consuming up to 300-350 ml per feeding in the second year of life). During the 24-hour food recall it was estimated that children < 12 months consumed about 150 ml per feeding and older children consumed about 250 ml per feeding, indicating room for improvement in this practice.
- When feeding, most mothers exhibit patience and encourage their children to eat. Children are fed directly by the care giver, seated on either the care givers’ lap or next to her. Some babies who were obviously ill had difficulty eating even small amounts.

Other feeding practices

- The informants with older children (> 6 months) reported that they prepared food and fed their children 2-4 times/day, generally with older children eating more frequently than younger children.
- Respondents reported a fairly typical diet (in this area) for their young children, starting with a light porridge mixed with a few ingredients for younger children (2-3 months old). The porridge is served thicker as the child get older. *Nshima* is introduced in small quantities at about 4 to 6 months (or earlier in some cases), and is fed more regularly and in larger amounts to older children (e.g. after 8 months).
- Care givers supplement the baby’s porridge seasonal fruits and vegetables if they are available. Vegetables that are available during the rainy season include pumpkin leaves (*chibwawa*), *rape*, sweet potato leaves, tomatoes, and cabbage. Available fruits include mango (seasonal), oranges, bananas, avocado, and guava, but these are not regularly available and are considered to be “unaffordable”. Only two children had consumed any fruits or snacks during the 24-hour food recall.
- Some but not all mothers appear to pay attention to food measurement and quantities when they feed their children. Many mothers will often encourage their children to eat more food when they lose interest. Various innovative strategies were reported. Frequently, respondents reported giving vitamins to babies who do not want to eat but few families had vitamins in their home during the trials visit. Care givers may also give gripe water (which contains alcohol) to babies with “stomach aches.”

- Respondents connect appetite and eating with health status, growth, and development. Babies who do not want to eat are suspected to be sick and taken to the health center. Weight gain, good appetite, playfulness, activity, and happy demeanor are signs of a healthy baby. To ensure a healthy baby, mothers suggest providing good food (including breastfeeding), health (including weighing and immunization), and care (including bathing, warm dressing, and psycho-social care).

Home hygiene and sanitation

- Most homes have soap for washing hands and/or dishes but soap was not used during the observations, particularly for hand washing.
- Homes do not have adequate facilities for safely storing milk and food. As a result, most families only prepare enough food for one meal at a time. Leftover food is consumed by other children or family members. Leftover infant formula is sometimes stored for later feeding.
- Some homes have toilets and inside tap water, but most use pit latrines and rely on communal water taps. Water availability and sanitation vary by home/neighbourhood. Some parts of the project area are clean and well-organized and other parts are unclean and lack basic facilities.
- Relatively few homes had animals (e.g., dogs, chickens, goats, etc.) observable in the living areas.
- Most children appeared to be well-cared for and loved. Most appeared clean and neat; alert and active. However, some children in the sample were visibly sick and/or malnourished during the household interviews.

Health Providers' and TBA's Case Load and Management Practices

- Most health providers interviewed provide infant feeding counselling every day, and some provide counselling about once a week. Counselling is done individually and in groups at the antenatal clinic, and at the weekly clinic for malnourished children in Lubuto and Twapia. The counselling generally covers the importance of exclusive breastfeeding for about 6 months; breastfeeding on demand; maternal nutrition; introducing complementary feeds; and providing a balanced diet in the cases of stagnant growth.
- Traditional birth attendants also counsel women on infant feeding when they see them. This advice concerns exclusive breastfeeding, the importance of colostrum, breastfeeding on demand, and complementary foods.
- The common breastfeeding problems encountered by health providers included improper positioning and attachment; cracked nipples and breast infections; and insufficient breastmilk syndrome. TBAs reported encountering mothers with breast engorgement;

insufficient breastmilk; and problems related to breastfeeding among working mothers.

- When interacting with clients, some providers only give information, whereas others appear to dialogue with women in a counselling fashion. Some health providers appear to have a negative attitude and lack empathy toward their clients.
- Health providers indicated that they might advise a woman not to breastfeed if she had weight loss, chronic diarrhea, or tuberculosis - the signs and symptoms of AIDS. Other health providers, however, indicated that there were no conditions where they would advise women not to breastfeed because of the lack of affordable alternatives for infant feeding.
- Some health providers and TBAs have provided counselling about HIV and infant feeding. In one case, the counselling took place when a mother was very ill and weak, and the husband could afford to buy formula. However, in this case, the baby got sick and was still in the hospital. Other cases where counselling was given occurred when the baby was already sick or malnourished. Some providers said that because you “don’t know infants’ status at birth, it is better to continue breastfeeding since the baby is probably already infected.”
- All providers felt that it would be very difficult or impossible for women in their communities to safely offer replacement foods to newborn babies. Most felt that people could not afford infant formula, and the time needed to boil water and clean utensils would be too great. Others noted the stigmas associated with not breastfeeding (that people would suspect HIV/AIDS, shun them, think they are crazy, and gossip).
- TBAs were divided in their opinions about breastfeeding among HIV-positive women. Three TBAs felt that women with AIDS or other severe illnesses should not breastfeed. One TBA felt that it was okay for an HIV-positive mother to breastfeed her own child but she should not breastfeed anyone else’s baby. Alternatives to breastfeeding suggested by the TBAs included use of infant formula (most often suggested), cows’ milk, and wet-nursing. No TBA reported ever delivering a mother who decided not to breastfeed.
- All health providers felt confident about their ability to counsel women about infant feeding. However, many requested more information about HIV and infant feeding in order to learn more about the subject. Other information requested included information on feeding a balanced diet (in local language); how to counsel women about nutrition; different methods of preparing the high energy-protein supplement; vitamin A supplementation; and general nutrition and infant feeding using locally available foods. Counselling aids and other educational materials were desired. TBAs also requested additional information on infant feeding and HIV/AIDS, family planning, and general hygiene.
- It was difficult to discern the actual case load in the health centers, but all providers felt that the clinics saw many people each day, and cases of diarrhea among children and adults were very common. All the health centers were very crowded (morning and

afternoon) on the days of the field work. Many mothers come to the well-baby clinics for weighing and immunizations. The health providers (nurse midwives) rotate throughout the month and most provide all services (well care, sick care, antenatal care, etc.). Two or three providers per health center are trained to provide family planning services.

- TBAs reported delivering about four mothers per week, usually in the mother's home and at night. Most TBAs were not paid for their services although some received gifts in kind such as soap. Problems encountered by TBAs among their patients included loss of appetite, swollen legs, and refusal to attend the antenatal clinic. Some TBAs also assist at the health center with deliveries and health education.
- TBAs reported the following birthing practices: spontaneous rupturing of membranes; use of new blades for cutting the umbilical cord; turning the baby upside down to drain mucus; and cleaning the baby with a cloth. Babies are given to their mothers right away. TBAs interviewed do not usually give any herbal mixtures to hasten labor or delivery. TBAs do not have delivery kits and these are urgently needed; gloves are available but in short supply. Most TBAs dispose of placentas in a pit latrine, although some reported that family members like to bury them.

Reactions to the feeding recommendations:

- Cup-feeding was thought to be easy and convenient (particularly among care givers who had not started giving a feeding bottle). It was challenging but not impossible for night-feeding, although some respondents worried about the baby choking or the care giver falling asleep. However, most cup-feeding trials were carried out among women with children 5 months and older, and it may be considerably more challenging to encourage and support mothers of newborns in their cup-feeding practices.
- Respondents felt that care givers could switch from a feeding bottle to cup feeding if they accustomed the child to it bit by bit; if someone other than the baby's mother had the responsibility for the switch; if care givers were told about the risks of contamination and diarrhea associated with bottle-feeding; and if food or milk was withheld from the baby so he was very hungry when the cup was being introduced.
- Most women already boil water (at least once a day for drinking) so boiling water for infant formula or milk preparation should not be difficult. However, any instructions about boiling times should be given in relation to the time required to perform a known activity.
- The recommendation to prepare each formula or milk feed individually (and not store prepared feeds for later use) was problematic because infants grew impatient and cried while the milk was being prepared. One option, therefore, is for mothers to boil enough water for the whole day of feeds and store it in a covered container for later warming. Cows' milk servings, however, will need to be prepared individually. To avoid excessive evaporation and burning, the cows' milk should be mixed with the proper quantity of water (for children < 6 months), boiled (for 5 minutes), cooled, and sugar added (last)

before serving.

- Care givers are generally willing to boil feeding utensils and some are already doing so, although others are not convinced of the need for sterilizing them. JIK is expensive and not readily accepted as a cleaning agent for cooking utensils and should not be recommended.
- Most families buy heat-treated, long-life milk on a daily basis (or whenever money is available) and are willing to cook with it or feed it undiluted to children > 6 months. However, few families now give diluted milk to their babies before 6 months. Leftover milk is likely to be consumed by the entire family.
- Few women regularly express breastmilk for their children's consumption. Most mothers are never separated from their young babies and therefore do not see a need for breastmilk expression (unless there is a breast problem or illness-related separation). Mothers of older infants generally expect them to eat solid foods or porridge when they are separated. However, the idea of expressing milk for later feeding was appealing to women who feared that foods and/or formula would not be available all the time, or who were looking for a feeding option for their children while they were away at work. Mothers, however, worry that they do not have enough milk for exclusive breastfeeding and expressed-milk feeding.
- Although some women are willing to express breastmilk from time to time, the recommendation to express breastmilk and heat it for 30 minutes (Holder pasteurization) does not seem very practical in this setting for individual women. The suggestion that breastmilk should be boiled was met with surprise and disbelief (among health providers with whom it was discussed) and could create a negative impression about the safety of breastfeeding in general.
- The feeding frequencies and quantities recommended at different ages were acceptable to care givers and could be implemented as long as appropriate foods are available. Time may be a limiting factor for some care givers (who are working or busy with other children). Greater attention should be given to increasing the amount of food consumed at each feeding (because feeding frequencies are generally adequate, and observations and recall data suggest that quantities consumed are small).
- The idea of enriching porridge with a variety of locally available foods and ingredients was readily accepted, as was the serving of solids with *nshima* (instead of liquid relish). Increased quantities are more likely to occur with porridge rather than *nshima* based on care givers' and babies' reactions in the trials. Fruits and snacks are thought to be too expensive, and their promotion and consumption may be limited to seasonal availability.
- Most mothers are able, in principle, to measure out ingredients, but most cooking is done without precise measurements. There is also a variety of feeding cups and plates in use (ranging in size from 150-300 ml). Therefore, any training related to food or milk quantity and measurement (e.g., milk dilution, volumes for feeds, etc.) will require care

givers to bring their own feeding utensils to any counselling session, in order for counselors to calculate the proper measurements for feeds (and these must be adjusted as the child gets older).

- Care givers clearly want to do what is best for their children and they are eager to learn more about infant feeding. If they had the resources, they would happily adopt most recommendations. However, many families buy their food on a meal-by-meal basis each day (small packets of sugar, maize meal, etc.) and simply cannot afford to buy infant formula or replacement feeds regularly. The end result is that care givers try to stretch what they have by over-diluting or under feeding. The active participation of men in replacement feeding is essential in this community.
- The situation of infant orphans is particularly dire. Families are struggling to care for the young children of deceased mothers, but many care givers are unable to work or have no income. Most orphan care givers are almost completely dependent on irregular donations by other family members (who are also struggling to get by).

Recommendations for the project's training and communications strategies

- Even in areas with high HIV-seroprevalence, the majority of women will be uninfected and there will be those who will not know their HIV status. Health providers and community support group members should be trained in lactation management, complementary feeding, and replacement feeding practices so they are able to support *all* women in the community (and not only those who are HIV-positive).
- To further ensure that breastfeeding is protected, promoted, and supported among untested and HIV-negative mothers, the Baby Friendly Hospital Initiative (BFHI) should be implemented in the project area.
- The project should be cognizant of the aims and principles of the Zambia and International Code of Marketing Breastmilk Substitutes throughout its implementation.

HIV/AIDS

- There is a high level of awareness about HIV/AIDS, but the distinction between being HIV-positive and having AIDS is not apparent. This issue should be explored further in the community assessment and clarified in future communication efforts.
- HIV/AIDS must be de-stigmatized perhaps based on the idea that everyone in the community has already been affected by the disease in one way or the other.
- The availability of the HIV voluntary counselling and testing services being provided through the project should be publicized widely. However, HIV testing and post-test counselling services should be organized in a way that ensures confidentiality. The services should be organized so that neighbours and non-family members attending the health center are not aware when an individual is tested and receives post-test

counselling. Test results must remain confidential.

- Counselling and testing should be made available to women and their partners. Community-based testing, counselling, and support should be developed.
- Women and men who test positively will need extra emotional support, particularly those who cannot share the information with their family and those who face abandonment because of the disease. Those who test positively will need continuous counselling and support to maintain their well-being. Women and men who test negatively will also need counselling to maintain their health and negative status.
- Greater accessibility to testing needs to be coupled with strategies to encourage people to know their status in order to prevent infecting others or to prevent getting infected themselves (not just to confirm a positive result).
- Information about the stages of infection and how to live more positively with HIV needs to be provided to reduce the fatalism about the disease and to promote behavior change.

Mother-to-child transmission

- Straightforward and accurate information about mother-to-child transmission of HIV, including the risks during pregnancy, child birth, and breastfeeding is urgently needed in this population.
- Training on these topics should be provided at all levels: for health center staff, infant feeding and HIV counselors, traditional birth attendants, neighbourhood committee members, and community support systems. Training should cover knowledge, attitudes, and practices (skills).
- Health workers and traditional birth attendants should be trained in procedures to reduce the transmission of HIV during labor and delivery.
- Neighbouring health center staff and community groups should be sensitized about MTCT issues in preparation for scaling up the project.
- Some respondents reported hearing information that women with HIV should not breastfeed, including information provided at different training sessions. The demonstration project, through the Ndola HIV/AIDS Task Force, should monitor the information on breastfeeding and HIV being provided by other sources in the community and proactively ensure that contradictory messages are not being delivered.

Infant feeding counselling and related practices

- The project should endorse and follow the principle of *informed choice* - that it is the mother's right to choose how to feed her baby, and the infant feeding counsellor's role to provide her with the information needed to help her make this choice. Therefore, the

project must develop recommendations for all HIV-positive women: those who choose to breastfeed and those who choose not to breastfeed.

- Counsellors should ensure that HIV-positive mothers *understand* the risk of HIV transmission through breastfeeding, as well as the risks associated with replacement feeding in resource and environmentally-constrained settings.
- Counselling related to HIV and infant feeding must take into consideration the social stigma a non-breastfeeding mother faces in this population. Counsellors need to be careful not to force women into decisions that will cause them or their babies additional physical and psychological harm.
- Reaching women during pregnancy is a major strategy of the project. For antenatal HIV-positive mothers who choose not to breastfeed, counselling about replacement feeding should begin right away so that they are prepared to safely practice replacement feeding when their baby is born.
- Many positive infant feeding and caring practices, concepts, and perceptions exist in the community and these should be reinforced through the project.
- Hand washing should be recommended by the project, particularly before food preparation, after diaper changes, and before feeding. Inappropriate practices, such as feeding tea or custard (maize starch) should be discouraged.
- Infant feeding practices should be monitored and evaluated throughout the project, and corrective actions taken, if needed. The effect of the project on breastfeeding practices of HIV-negative and women of unknown status should be considered.

Recommendations for HIV-positive women who choose to breastfeed

- HIV-positive woman who choose to breastfeed should be counseled on how to breastfeed exclusively until the baby is 6 months old.
- If specific breast conditions are encountered, such as cracked nipples or mastitis, mothers should be advised to continue breastfeeding with the unaffected breast, and express and discard the milk from the infected breast.
- If the baby has oral lesions, the mother should be advised to have them treated immediately at the health center. To minimize HIV transmission risk, the mother should be counseled to express and heat-treat her breast milk before feeding her baby. She should be instructed on proper cup-feeding practices. Normal breastfeeding can be resumed after the lesions heal.
- If the mother has symptoms of fever, cough, diarrhea, or malaria she should be encouraged to seek immediate medical attention.

- The project should counsel HIV-positive women about the continued risks of HIV transmission after the period of exclusive breastfeeding.
- If individual mothers want to stop breastfeeding, they should receive counselling to discuss feeding options and to make sure they are able to safely and continuously replacement feed.

Recommendations for HIV-positive women who choose NOT to breastfeed

- Based on the findings of this research, the project should recommend that HIV-positive women who choose *not* to breastfeed use infant formula⁴ for feeding their babies in the first 6 months of life. This recommendation is being made for the following reasons:
 - the cost comparability between cows' milk and infant formula feeding in the project area;
 - the complicated steps for preparing cows' milk (e.g., dilution with water, addition of sugar, boiling of mixture, etc.), and the additional need for multivitamins;
 - few women already feed babies with diluted cows' milk (fresh or powdered), whereas several care givers are using (or have used) infant formula;
 - formula is more likely to be reserved for the baby's consumption, whereas cows' milk (and other foods) will probably be shared with other family members; and
 - powdered formula is easier to store than fresh cows' milk in this population.
- This recommendation is made with the following concerns and reservations:
 - current prices for infant formula are too high to make it affordable for most families in the community;
 - infant formula is likely to be over-diluted to stretch limited supplies;
 - infant formula is not as easy to obtain as fresh cows' milk in the project area; and

⁴The project will *not* provide free or subsidized infant formula to HIV-positive women. It will also not promote a specific brand of formula for replacement feeding.

- the price of formula appears to fluctuate more than the price of fresh cows' milk, (particularly Lactogen, which is the most popular brand).
- The project should monitor the availability and price of infant formula in the area.
- The project should recommend fresh cows' milk feeding (with proper dilution and preparation) for the times when infant formula supplies run out or when there are no funds to purchase a tin of formula.
- The project should train infant feeding counselors on how to cup-feed young children. Women who choose not to breastfeed will need encouragement and support in proper cup-feeding practices, particularly for newborns and infants less than 3 months old. Counsellors need to provide mothers with strategies for night feeding.
- Based on existing practices, there is a very strong possibility that excess prepared formula will be stored in unhygienic conditions for later feeding. The adverse consequences of unsafe (already prepared) formula storage may be minimized but not completely eliminated by emphasizing the proper sterilization of feeding utensils and boiling drinking water for the specified period every day. Care givers should be warned against the dangers of formula storage and its potential for causing diarrhea.
- Women who choose not to breastfeed should be monitored continuously in the community to answer questions and resolve feeding problems. These women should be referred to the health center if they encounter any feeding or health problems. The weight gain of non-breastfed children should also be monitored regularly because poor weight gain is a signal that the replacement feeding is not going well or the child is sick.

Replacement feeding recommendations for children 6 months and older

- The recommended age-specific feeding frequencies and quantities described in the trials can be used in the project because they were well-accepted by care givers and others. Most feeding improvements were encountered with recipes for porridge, and porridge was still being given to children even once they had started on *nshima*. In light of these observations:
 - The project should recommend that non-breastfed children 6 months and older be given an enriched porridge at least 3 times per day.
 - This enriched porridge should be prepared with milk, oil, and sugar. Other ingredients, such as pounded groundnuts, *kapenta*, vegetables, beans, and beef can be added to enrich porridge.
 - Servings should vary in size from 200 to 300 ml, increasing with the age of the child.
 - Children should drink fresh (or reconstituted) boiled cows' milk at least twice a day (at least 100 ml/serving).

- In addition, care givers should give their children *nshima* with mashed or pounded solid foods instead of the liquid relish (soup) only.
- Bananas, oranges, mangoes, avocados, and other fruits in season, as well as beef and fish, should be given whenever possible. Eggs should be avoided until after the child is one year old.
- Care givers should introduce solid foods gradually. The frequency of feeding and the quantities served should be increased as the child gets older.
- Care givers should be encouraged to continue feeding during child illnesses and to increase the frequency and amount of feeding, especially of enriched porridge, when the child has recovered and appetite has returned.
- Care givers' should be reminded that some times children will need to become accustomed to new foods or quantities little by little. They should continue to feed their children patiently, persistently, and with love and attention, which are traits that were commonly observed during most home visits.

Other recommendations

- This is a predominantly literate population that has been to school and can read and write. Written materials and take-home instructions in English and local languages can be provided to most respondents.
- Existing materials and general guidelines on infant feeding (e.g, those developed by NFNC/BASICS) should be reviewed for use by the project.
- Several interventions must accompany all efforts related to HIV counselling and testing and replacement feeding. These include:
 - primary prevention of HIV for men and women;
 - income generating activities to improve household food security;
 - continuous monitoring and home visits by community support groups to make sure there are no changes in the conditions of the household, family, mother, or baby, with psycho-social and medical support and/or referrals as needed;
 - well child care, including immunizations and growth monitoring/promotion, for all children;
 - maternal health appraisal and family planning services; and
 - partner counselling on responsible parenting and infant feeding.

- Services to provide care and support for orphaned infants are urgently needed in this community.

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