

**INFANT FEEDING PRACTICES OF HIV POSITIVE MOTHERS IN
LUSAKA DISTRICT**

BY

Dr John Banda, MB ChB

**A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN
PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE MASTERS
DEGREE IN PUBLIC HEALTH (MPH)**

**Department of Community Medicine
School of Medicine
The University of Zambia
Lusaka**

ABSTRACT

Despite the high prevalence of breastfeeding (98%) in Zambia, the majority of infants are not fed in compliance with WHO/UNICEF recommendation. The recommendation calls for a period of exclusive breastfeeding for six months and introduction of complementary foods between six and nine months while continuing with breastfeeding up to two years. Only 40% of infants less than six months of age are exclusively breastfed in Zambia (Central Statistical Office et al, 2002).

The objective of the study was to determine whether HIV positive women do provide mixed feeding to their infants contrary to WHO/UNICEF recommendation. A total of 125 HIV positive mothers and 125 HIV negative mothers were recruited for the study. Both groups were identified from the PMTCT register at Mtendere Health Centre in Lusaka using simple random sampling. The mothers were identified as they came for postnatal clinic and children's clinic. A structured questionnaire was used to interview the respondents.

The study revealed that mixed feeding is practiced by both HIV positive mothers and HIV negative mothers ($p < 0.001$). 35.2% of HIV positive mothers and 2.4% of HIV negative mothers provided pre lacteal feeds in form of water or glucose to their infants in the first one hour of birth. Foods such as cereal, porridge, juices, vegetables and fruits were introduced to infants as early as in the first month by both HIV positive and HIV negative mothers.

The study revealed that mixed feeding is practiced by HIV positive mothers and starts soon after delivery. The tendency to mixed feeding highlights the importance of strengthening infant feeding counselling and follow up support to HIV positive mothers.

DEDICATION

This study is dedicated to my grandmother, Rachel Banda, who inspired me to study medicine.

APPROVAL

This dissertation by Dr John Banda is approved in partial fulfillment of the requirements for the award of the Masters degree in Public Health by The University of Zambia.

Examiners

Name :

Signature: Date:

Name :

Signature: Date:

Name :

Signature: Date:

Head of Dept

Name :

Signature: Date:

ACKNOWLEDGEMENTS

I would like to sincerely acknowledge the great assistance rendered to me by various people without whom this work would not have been accomplished.

Firstly my gratitude goes to the Ministry of Health and African Development Bank for financial support, Kalomo District Health Management Team for material and moral support.

Secondly my gratitude goes to my supervisors Prof Siziya and Dr Ndoyo-Likwa for the invaluable advice and support. In addition, I like to thank all lecturers in the Department of Community Medicine for their advice and encouragement.

Lastly I would like to thank my family; my beloved wife Pizye, my two sons Mwase and Kateya, for patience, understanding and emotional support.

TABLE OF CONTENTS

	Page
Title.....	i
Abstract.....	ii
Dedication.....	iii
Declaration.....	iv
Approval.....	v
Acknowledgements.....	.vi
Table of contents.....	.vii
List of tables.....	x
List of figures.....	.xi
Abbreviations.....	.xii
CHAPTER 1: INTRODUCTION.....	1
1.1 Background.....	1
1.2 Problem statement.....	2
1.3 Rationale.....	3
1.4 Significance of study.....	4
CHAPTER 2: LITERATURE REVIEW.....	5
2.1 Introduction.....	5
2.2 Breastfeeding, HIV and AIDS.....	6
2.3 Replacement feeding.....	8
2.4 Feeding options for HIV positive mothers.....	9
2.5 Operational definitions.....	10

CHAPTER 3: STUDY OBJECTIVES

3.1 Objective of the study.....11

3.2 Specific objectives.....11

CHAPTER 4: METHODOLOGY..... 11

3.1 Introduction..... 11

3.2 Inclusion criteria..... 11

3.3 Exclusion criteria..... 11

3.4 Data collection.....10

3.5 Sample size and sampling..... 12

3.6 Study site.....13

3.7 Quality control.....13

3.8 Ethical consideration..... 13

3.9 Data processing and analysis..... 14

3.10 Limitation of study.....14

CHAPTER 5: RESULTS..... 14

5.1 Characteristics of respondents..... 14

5.2 Characteristics of children..... 15

5.3 Characteristics of breastfeeding..... 17

5.4 Characteristics of maternal health..... 18

CHAPTER 6: DISCUSSION..... 20

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS.....	22
7.1 Conclusion.....	22
7.2 Recommendations.....	22
REFERENCES.....	23
ANNEXES.....	27
Annex 1: Permission from District Director of Health (Lusaka) to collect data.....	28
Annex 2: Approval from Research and Ethics Committee, UNZA.....	29
Annex 3: Participants information sheet.....	30
Annex 4: Questionnaire.....	31

LIST OF TABLES

	Page
Table1: Maternal socio-demographic data.....	15
Table 2: Age distribution of children.....	16
Table 3: Infant feeding in the first hour after birth.....	17
Table 4: Received other foods other than breast milk in past one week.....	17
Table 5: Number of mothers who experienced breast problems.....	19

LIST OF FIGURES

	Page
Figure 1: Time taken to put child on breast after delivery.....	16
Figure 2: Foods given by HIV positive mothers to infants below 6 months...	18

LIST OF ABBREVIATION

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
ARVs	Antiretroviral drugs
BFHI	Baby Friendly Hospital Initiative
BMS	Breast milk substitutes
CSO	Central Statistical Office
HIV	Human Immunodeficiency Virus
LBW	Low Birth Weight
MoH	Ministry of Health
PMTCT	Prevention of Mother –To-Child Transmission
STI	Sexually transmitted Infection
UNAIDS	Joint United Nations Program on HIV/AIDS
UNICEF	United Nations International Children’s Emergency Fund
UNZA	University of Zambia
WHO	World Health Organization
ZDHS	Zambia Demographic Health Survey

CHAPTER 1: INTRODUCTION

1.1 Background

Pregnant women who are infected with the human immunodeficiency virus (HIV) face an increased risk of poor pregnancy outcomes and the possibility of transmitting the virus to their newborn. As many as 25-35% of HIV positive pregnant women pass the virus to their newborns during pregnancy, or childbirth, or through breastfeeding (Coutsoudis, 2001).

If a woman is infected with HIV, her risk of transmitting the virus to her newborn is higher when she stays as healthy as possible. Smoking, substance abuse, vitamin A deficiency, malnutrition and sexually transmitted infections (STIs) are all associated with high rates of mother to child transmission of HIV. The viral load and the clinical stage of the HIV infection also contribute to the chances of transmitting the virus to newborn. In addition, factors related to labour and childbirth (preterm labour, placental disruption, duration of membrane rupture and whether the birth is vaginal or caesarean) affect the risk that a pregnant woman will transmit the virus to the child. Breastfeeding is also a risk factor for mother to child transmission (WHO, 1998).

The risk of transmission depends on whether the mother breastfeeds exclusively or not, on duration of breastfeeding, on the mother's breast health and the mother's nutritional and immune status, including the viral load. The risk of infection is greater if the mother becomes infected while she is breastfeeding.

The HIV pandemic has raised dilemmas about infant feeding recommendations and highlighted the importance of accurate and consistent documentation of early infant feeding practices in order to correctly estimate the risks of breastfeeding in mother to child transmission.

UNAIDS/WHO/UNICEF (WHO, 1998) supports the right for every HIV infected woman to choose safe alternatives to breastfeeding based on full information.

This is a delicate matter that should be handled with caution and care so that health services strive to prevent transmission through breastfeeding for known victims while at the same time continue to protect and promote breastfeeding and its benefits for the rest of the women.

Despite the high prevalence of breastfeeding (98%) in Zambia, the majority of infants are not fed in compliance with WHO/UNICEF recommendation. The recommendation calls for a period of exclusive breastfeeding for six months and introduction of complementary foods between six and nine months while continuing with breastfeeding up to two years. Only 40% of infants less than six months of age are exclusively breastfed in Zambia (Central Statistical Office et al, 2002).

1.2 Problem statement

Breastfeeding is the dominant feeding practice in Zambia and is known universally as the best way to feed an infant. However, breastfeeding is one of the significant but preventable ways an infant can contract HIV from the mother. A child stands the greatest risk estimated to be 20% of vertical transmission during the third trimester of pregnancy and during child birth and an additional 15% risk through breast milk (UNICEF, 1998).

Exclusive breastfeeding for six months is advocated in Zambia. However, clinicians are now faced with the challenge of advising women infected with HIV about the risks and benefits of other infant feeding options. Mixed feeding results in higher transmission rates of mother to child transmission compared to other alternative feeding options. Studies that were done soon after introduction of prevention of mother to child transmission (PMTCT) in Zambia showed that for most mothers breastfeeding was the first option even for HIV positive mothers and that mixed feeding was practiced by HIV positive mothers despite counselling against this method of infant feeding (Omari et al, 2000).

1.3 Rationale of study

Ever since the human immunodeficiency virus (HIV) was first identified in breast milk and postpartum transmission of the virus was reported (Ziegler et al, 1985), policy makers have grappled with the need to develop appropriate guidelines to help HIV infected mothers decide whether they should breastfeed their babies or not.

Mothers are faced with a dilemma of competing risks:

1. The risk of mother-to-child transmission of HIV through breastfeeding,
or
2. The risk of infant morbidity or mortality from other causes if breastfeeding is withheld

The latter possibility becomes particularly meaningful in two contexts; first, in resource poor settings where infant morbidity and mortality rates are high, and second among those babies who already are HIV infected at birth and for whom breastfeeding is likely to prolong life.

Many women cannot opt for formula feed because doing so is not safe or affordable, or because they lack access to formula. For such women, the best option may be to breastfeed for the first six months of the infant's life while putting in place strategies to reduce the risk of mother to child transmission such as stopping breastfeeding at six months and then wean ly. At six months, the benefits of breastfeeding out weigh the risks of HIV (Coutsoudis, 2001).

Successful PMTCT programs should be able to show that increasing numbers of women are practicing exclusive breastfeeding with a proportion of women using replacement feeding and little use of mixed feeding.

1.4 Significance of study

Results of the study may help to review infant feeding counselling so that undesirable mixed feeding is not practiced by HIV positive women.

1.5 Research question

Is mixed feeding being practiced by HIV positive mothers contrary to WHO and UNICEF recommendation?

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Zambia has a population of approximately 11.7 million people and an estimated HIV prevalence of 14.3% in persons between 15 and 49 years of age. The HIV sero prevalence is significantly higher among women (16.1%) compared to men (12.3%), and also much higher in the urban populations (19.7%) compared to the rural populations (10.3%). It is estimated that about 1 million Zambians are infected with HIV (Central Statistical Office et al, 2007)

The HIV prevalence rate among antenatal clinic attendees is 19%. Approximately 150,000 infections occur in children yearly. Given the above statistics, it is estimated that approximately 25,000 children may become infected with HIV from their mothers each year in Zambia if no interventions are put in place (Ministry of Health, 2002; Kankasa et al, 2002).

The availability of short-course antiretroviral (ARV) regimens, combined with elements of improved maternal and newborn care, can significantly reduce the risk of mother to child transmission and prevent perinatal HIV infections (Rongkavilit, 2004). While these interventions are feasible, they do need to be adopted and implemented with appropriate standardization, logistical and management support, and with the necessary commodities.

Mother to child transmission can occur during pregnancy, at the time of delivery and through breast feeding. Based on compilation of studies, it is estimated that mother to child transmission rates without any antiretroviral intervention, range from 15-30% in the absence of breastfeeding to 25-35% if there is breastfeeding through six months and 30-45% if there is breastfeeding through 18 to 24 months (Coutsoudis, 2001).

Mastitis and other breast health problems are commonly reported in breastfeeding women. Serious breast pathologies causing inflammation and bleeding,

as well as subclinical mastitis, have been associated with postnatal HIV transmission (Lliff et al, 2005; Bland et al, 2007). In addition, conditions such as mastitis are known to interfere with the success and duration of optimal exclusive breastfeeding practice in the first six months after birth.

According to the PMTCT guidelines, mothers should be informed about the risks of mother to child transmission during infant feeding. Information to be given includes the options of exclusive breastfeeding for six months, followed by weaning abruptly or replacement feeding with breast milk substitutes (BMS). The risks of replacement feeds should be discussed and mothers should be encouraged to make their own choices on how to feed their children.

In a randomized trial of breastfeeding in Nairobi, 60% of HIV infected mothers chose not to enroll principally because of the publicity of being randomized to artificial feeding, and 30% of those allocated to this option did not comply (Nduati et al, 2000). The reason was stigma of HIV infection which had become associated with formula feeding. Conversely, in three qualitative research studies done in different communities in Zambia, non pregnant women given information on mother to child transmission risks, indicated that if they as mothers knew their HIV status, they would not breastfeed their infant as it would increase the risk of their infant developing AIDS (Siyandi et al, 1999).

2.2 Breastfeeding, HIV and AIDS

Before the emergency of HIV and AIDS, breastfeeding was recognized as the best way to feed infants in virtually all circumstances. This is no longer the case now with the advent of HIV and AIDS. Women with advanced HIV disease are at higher risk of infecting their infants through breastfeeding (Lliff et al, 2005). It is estimated that vertical transmission accounts for 90% of HIV infection in children. Given such a problem, joint WHO/UNICEF/UNAIDS guidelines on infant feeding have been issued to assist policy makers and health workers in addressing this

risk and helping to safe guard the rights of mothers and their children (WHO, 1998).

Central to these guidelines is the right of mothers to make decisions, on full and clear information, on what is best for them and their infants and to be able to carry out these decisions. This calls for access to voluntary and confidential HIV counselling and testing for both men and women. Pregnant women should be counselled on the risk of vertical transmission to their babies and on the benefits and risks of all the various infant feeding options.

Studies done in South Africa suggest that a combination of breastfeeding and artificial feeding has more potential harm to the infant in the first months of life and those who are exclusively breastfed, at least for the first three months, may face a significantly lower risk than was previously thought (Coutsoudis, 2001). The studies suggest that feeding other foods in addition to mother's milk in the first months of life may be what injures the baby's intestines and allows HIV to enter the body tissues. It is believed that the transmission in exclusively breastfed infants is low because they maintain a healthy intestinal epithelium, which acts as a barrier, and that breast milk contains immune factors which have been shown to have anti-viral and anti-HIV effects in vitro (Wahl et al, 1997; Newburg et al, 1992).

Prevention of breast milk transmission of HIV strategies should be integrated into an overall approach by health services to prevent HIV infection in women and their partners and reducing mother to child transmission (Siwale, 2003). Such measures should include promotion of safer sex, providing early detection and treatment of sexually transmitted infections, ensuring safety during blood transfusion, antiretroviral therapy and replacement feeding for the infant.

2.3 Replacement feeding

From birth to six months, an infant requires milk in some form as a necessity. If a mother is infected with HIV, it may be preferable to replace breast milk to reduce the risk of mother to child transmission of HIV to her infant. The risk of alternative feeding should be less than the potential risk of HIV transmission through breastfeeding so that infant morbidity and mortality from other causes do not increase (Thea et al, 2004). The main issues to be considered include the nutritional requirements, risk of bacterial infection, cost of alternative feed, effect on family planning, psychological stimulation of the infant and socio-cultural factors.

Replacement feeding should aim to provide the entire infant's nutritional requirements as completely as possible. Breast milk alternatives lack antibodies that protect against bacterial infections. Bacteria may therefore contaminate the feed during preparation, so it is imperative that high hygienic standards are kept during preparation and feeding. Even where hygiene is artificially fed infants suffer five times as many bacterial infections as breastfed infants. In situations where hygiene is poor, the risk of death from diarrhoea in artificially fed infant may be 20 times that of breastfed infants (WHO, 1998). Families feeding their infants with breast milk alternatives therefore need access to health care.

Women who do not breastfeed compromise the benefits of child spacing that breastfeeding provides. Another pregnancy too soon can cause the health of an HIV positive woman to deteriorate even more and results in potentially more HIV infected children to care for. It is thus essential for the mothers to have access to affordable and appropriate family planning methods. Since breastfeeding fosters a close social relationship between the mother and her infant, substituting it can be detrimental to this bonding resulting in lack of stimulation for the infant. Steps should be taken to help mothers ensure that replacement fed infants receive as much attention as breastfed infants do.

2.4 Feeding options for HIV positive mothers

For the first six months breast milk, commercial infant formula, home prepared formula or unmodified cow's milk formula could be given to the infant. Commercial infant formula based on modified cow's milk or soy protein has been found to be closest in nutrient composition to breast milk (WHO, 1998). It is usually adequately fortified with micronutrients including iron. It can be good option if the family has reliable access to sufficient formula, clean water, fuel, utensils, skills and time to prepare it accurately and hygienically. Home made formula can be made with fresh animal milk, with dried milk powder or with evaporated milk. Care is needed to avoid over concentration or over-dilution. Micronutrient supplements like iron, zinc and vitamins A and C and folic acid are also recommended. Unmodified cow milk with great caution, could be considered as an exceptional option by the HIV positive mother when the supply of cow milk is reliable and affordable for the first six months of life.

Modified breastfeeding such as early cessation of breastfeeding and heat treatment of expressed breast milk reduce the risk of mother to child transmission. Early cessation reduces the length of time for which an infant is exposed to HIV through breast milk. The optimum time for early cessation of breastfeeding is not known. However, it is advisable for an HIV positive mother to stop breastfeeding as soon as she is able to prepare and give her infant adequate and hygienic alternative feed (WHO, 1998). It could be a good option for those who find it difficult for social and cultural reasons to avoid breastfeeding completely.

Pasteurization at about 65°C for 30 minutes or boiling and then cooling in a refrigerator or cold water of expressed breast milk may be good option especially for sick and low birth babies (LBW) in a hospital setting. Heat treated breast milk is still nutritionally superior to other milks, though heat treatment reduces the level of the antibodies.

Other forms of breastfeeding such as use of breast milk banks and wet-nursing can also be good options. Breast milk banks are generally used as a source of breast milk for a short time especially for the sick and LBW new born. They are not usually an option for meeting the nutritional need of infants for long periods. It should be certain that donors are screened for HIV that donated milk is also screened.

Wet-nursing is practiced in some traditional setting. In a study done in Gabon, (Ramharter et al, 2004) found that 40% of lactating mothers also breastfed other children. Shared breastfeeding increases the exposure to potentially infectious individuals. UNICEF/WHO/UNAIDS recommends that wet-nursing be considered only when a potential nurse is informed of her risk of acquiring HIV from the infant in question; she has been offered HIV counselling and testing; she voluntarily takes HIV test and is found to be negative and when wet-nursing takes place in a family context with no payment involved.

2.5 Operational definitions

Breast milk substitute: Any food being marketed or represented as a partial or total replacement for breast milk whether or not suitable for that purpose.

Exclusive breastfeeding: Means giving an infant no other food or drink, not even water, apart from breast milk (including expressed breast milk) but with exception of drops of syrups of vitamins, mineral supplements and medicines.

Complementary feeding: Any food, whether manufactured or locally prepared, suitable as a complement to breast milk.

Replacement feeding: Means the process of feeding a child who is not receiving breast milk, with a diet that provides all the nutrients the child needs.

Mixed feeding: feeding with both breast milk and other foods or liquids.

Artificial feeding: Feeding with breast milk substitutes.

Wet nursing: Having another woman breastfeed the child. In this case a HIV negative woman

CHAPTER 3: STUDY OBJECTIVES

3.1 Objective of the study

The objective of the study was to determine the extent to which mixed feeding is practiced by HIV positive mothers.

3.2 Specific objectives

1. To determine timing of mixed feeding commencement and feeding patterns among HIV positive mothers
2. To determine type of foods given by HIV positive mothers to infants who are mixed fed
3. To identify demographic characteristics of respondents

CHAPTER 4: METHODOLOGY

4.1 Introduction

The study was a case-control study. The study population was drawn from the women accessing the PMTCT services at Mtendere Health Centre. The health centre is one of the eight large health centres in Lusaka District providing both out patient and inpatient services, and maternity services.

4.2 Inclusion criteria

HIV positive mothers with children aged 0 months to 12 months were recruited from among those attending the postnatal clinics and children's clinics.

4.3 Exclusion criteria

HIV positive women who had children older than 12 months and mothers who were sick or had sick infants were excluded from participating in the study.

4.4 Data collection

The study applied quantitative method (structured questionnaire) to collect the following variables

- Socio-demographic data
- Feeding pattern in the first week of life
- Current feeding pattern
- Wet nursing practices
- Expressed milk
- Maternal health status
- Breast health status and breastfeeding condition
- Infant health status
- Characteristics of maternal health: breast conditions and illness

4.5 Sample size and sampling

The sample size was determined by the formula

$$N = \frac{(P_1Q_1) + (P_2Q_2)}{(P_2 - P_1)^2} \times f(a \beta)$$

Where N is the sample size

P_1 is the proportion (33%) of HIV positive women who exclusively breastfeed their infants up to three months in Zambia (Aika et al, 2000).

P_2 is the expected proportion (40%) of mothers exclusively breastfeeding their infants in the general population (Central Statistical Office et al, 2002).

Q_1 is $100 - P_1$

Q_2 is $100 - P_2$

$f(a \beta) = 7.85$, two tailed test with power of study set at 5% and significance level set at 80%.

$$\text{Thus } \frac{(33 \times 77) + (40 \times 60)}{7^2} \times 7.85$$

$$\frac{2541 + 2400}{49} = \frac{4941}{49} = 100 \text{ participants in each group.}$$

Considering a response rate of 80% of subjects, then the required number of participants in each group was determined to be $100/0.8 = 125$.

Sampling: Simple random selection was used to select subjects.

4.6 Study site

The study was conducted at Mtendere Health Centre in Lusaka District.

4.7 Quality control

Quality control of data collection was achieved by training the research assistants in the administration of the questionnaire and pre testing the questionnaire.

4.8 Ethical consideration

Approval to carry out the research was obtained from Department of Community Medicine (UTH) and the Research and Ethics Committee (UNZA). Permission was obtained from Lusaka District Health Management Team and Lusaka Provincial Health Office. Informed consent was obtained from the respondents after explaining the objectives of the study. All information obtained was held in confidence and the identity of the respondents was concealed.

4.9 Data processing and analysis

Data obtained from the questionnaire were checked, verified and entered in a computer. Data cleaning and analysis was done using Statistical Package for Social Sciences (SPSS). Quantitative data output was obtained by cross tabulations and frequencies of each variable. Chi square tests were performed to check level of independence between variables.

4.10 Limitations of the study

The mothers in the study were recruited from the health centre. More information on type of food given to infants would have been obtained had the participants been interviewed at their homes. The mothers were aware of the nature of the study through informed consent; this could have influenced their responses. In addition, the research assistants were aware of the status of mothers which could have been another source of bias.

CHAPTER 5: RESULTS

5.1 Characteristics of respondents

A total of 125 infants born of HIV positive mothers and 125 infants born of HIV negative mothers were assessed for feeding history. The majority of respondents were of ages falling between 21 and 30 years of age (61.6% for positive mothers and 57.6% for negative mothers). 85.6% HIV positive women were married while 92.2% HIV negative women were married. In addition the majority of respondents in both groups had attained primary level education i.e. 49.6% HIV positive mothers and 54.4% HIV negative mothers.

The common mode of delivery in both groups was spontaneous vaginal delivery with a few having delivered through caesarean section. Nearly all HIV positive mothers (94.4%) received antiretroviral drugs (Nevirapine and Zidovudine) for

prevention of mother to child transmission of HIV during pregnancy, labour and delivery.

Table 1: Maternal socio-demographic data

Characteristics	HIV positive mothers n (%)	HIV negative mothers n (%)	p value
<i>Mother's age</i>			0.002
Less 21	14 (11.2)	34 (27.2)	
21-30	77 (61.6)	72 (57.6)	
31and above	34 (27.2)	19 (15.2)	
Total	125 (100)	125 (100)	
<i>Marital status</i>			0.067
Single	18 (14.4)	9 (7.2)	
Married	107 (85.6)	116 (92.8)	
Total	125 (100)	125 (100)	
<i>Level of education</i>			0.664
None	10 (8.0)	11 (8.8)	
Primary	62 (49.6)	68 (54.4)	
Post primary	49 (39.2)	42 (33.6)	
Total	125 (100)	125 (100)	

5.2 Characteristics of children

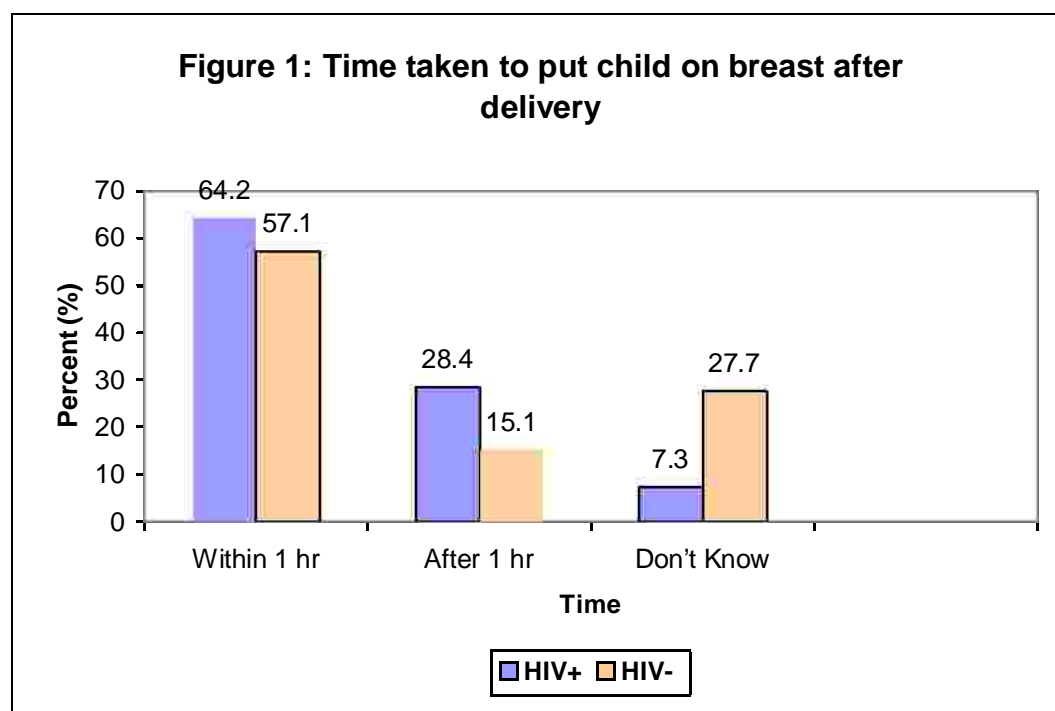
The majority of infants among the HIV positive mothers were between 4 and 12 weeks (49.6%), while among the HIV negative mothers were above 29 weeks (42%). The sex ratio in both groups was nearly 1:1. These results are shown in table 2.

Table 2: Age distribution of children

Characteristics	HIV positive mothers n (%)	HIV negative mothers n (%)	p value
Less than 4 weeks	19 (15.2)	17 (13.6)	< 0.001
4 - 12weeks	62 (49.6)	36 (28.8)	
13 – 20 weeks	15 (12.0)	10 (8.0)	
21 – 29 weeks	12 (9.6)	20 (16.0)	
Above 29 weeks	12 (9.6)	42 (33.6)	
Total	125 (100)	125 (100)	

5.3 Characteristics of breastfeeding

Mixed feeding was noted to commence early in both groups of women. 64.2% of HIV positive mothers and 57.1% of HIV negative mothers initiated breastfeeding within the first one hour of life (figure 1)



The study revealed that HIV positive women (35.2%) were more likely to give their infants water or glucose before initiating breastfeeding than HIV negative women (2.4%) as shown in Table 3.

Table 3: Infant feeding in the first hour after birth

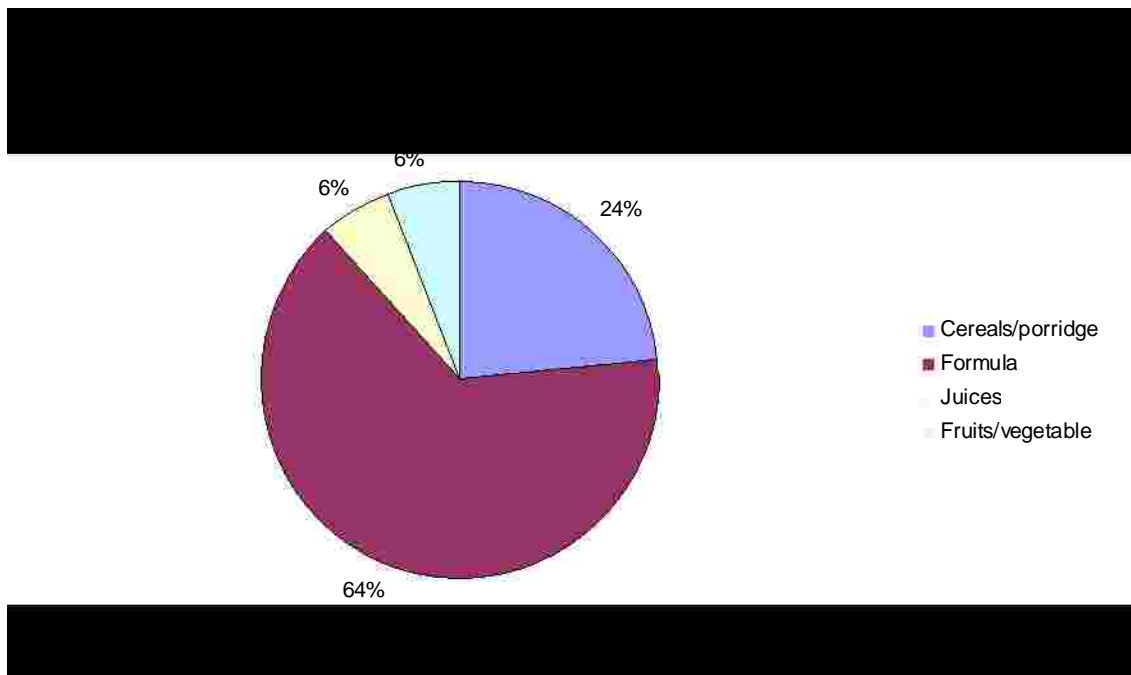
Characteristics	HIV positive mothers n (%)	HIV negative mothers n (%)	p value
Infant received water/glucose			< 0.001
Yes	44 (35.2)	3 (2.4)	
No	81 (64.8)	122 (97.6)	
Total	125 (100)	125 (100)	

During the interviews the mothers expressed awareness exclusive breastfeeding, replacement feeding and mixed feeding. Despite being aware of the danger of mixed feeding as learnt from the counselling sessions during both antenatal and postnatal clinics, 26% positive mothers and 46% negative mothers with infants below 6 months reported having fed their with other foods in the past one week prior to the interview (Table 4).

Table 4: Received other foods other than breast milk in past one week

Characteristics	HIV positive mothers n (%)	HIV negative mothers n (%)	p value
No	82 (75.9)	71 (60.7)	< 0.001
Yes	26 (24.1)	46 (39.3)	
Total	108 (100)	117 (100)	

Figure 2 shows the type of complementary foods HIV positive mothers and HIV negative mothers gave their infants. The common foods given were cereal and porridge (64%) followed by formula milk (24%).



5.4 Characteristics of maternal health

Both groups recalled being sick since delivery and the common illness was malaria. All mothers that were sick reported seeking medical advice. However, none of the HIV positive mothers were admitted and 3.2% of the HIV negative mothers reported having been admitted.

Breast problems such as cracked nipples, rashes and mastitis were identified in both groups. However, 94 HIV positive mothers and 47 HIV negative mothers stopped breastfeeding while they encountered breast problems (Table 5).

Table 5: Number of mothers who experienced breast problems

Characteristics	HIV positive mothers (n=125) n (%)	HIV negative mothers (n=125) n (%)
Cracked nipples	89 (71.2)	21(16.8)
Rash	89 (71.2)	21(16.8)
Boil	18 (14.4)	21(16.8)
Breast enlargement	0	41(32.8)
Ring worm	0	21(16.8)
Stopped breastfeeding	94 (75.2)	47(37.6)
Did not stop breastfeeding	31(24.8)	78 (62.4)

CHAPTER 6: DISCUSSION

The United Nations recommends that HIV positive mothers should never use mixed feeding (WHO/UNICEF/UNAIDS, 2000). They should either breastfeed exclusively or replacement feed, not mix. Feeding patterns are the principal determinants of a child's nutritional status and poor feeding patterns exposes children to higher risks of morbidity and mortality. Breastfeeding has been internationally recognized and promoted as the best method to feed an infant.

Breast milk should be the first infant food, but it was observed that both groups of mothers gave pre lacteal food such as water and glucose soon after delivery. Based on stipulated recommendation against mixed feeding, mothers are provided with infant feeding choices by health workers. The study revealed that mixed feeding is practiced by HIV positive mothers as well as HIV negative mothers and that the practice starts on the first day of the infant's life. 35.2% of HIV positive mothers and 2.4% of HIV negative mothers gave pre lacteal feeds in form of water or glucose to their infants in the first one hour of birth. Other foods such as cereal or porridge, juices, vegetables and fruits were introduced to infants in the first month by both HIV positive and HIV negative mothers.

Studies done in Zambia, looking at feeding practices of HIV infected mothers, found similar results (Omari et al, 2000; Molly et al, 2005). The investigators reported that HIV positive mothers changed to mixed feeding early whether they started out with replacement feeding or exclusive breastfeeding. Similar studies looking at infant feeding in the context of HIV in other countries also reported similar findings. Early mixed feeding was reported in a Botswana study (Shapiro et al, 2003). The Botswana study found that most mothers who initiated replacement feeding changed to mixed feeding even though the PMTCT program used intense follow up to prevent mixed feeding. A study in Tanzania found that 85% HIV positive mothers started exclusive breastfeeding but 46%

were mixed feeding within a few days of delivery (de Paoli et al, 2000). In a Ugandan study, all HIV positive mothers started out exclusively breastfeeding but switched to mixed feeding by three months (Bakaki, 2002).

In this study it was noted that both HIV positive and HIV negative mothers stopped breastfeeding when they experienced breast problems. This practice promoted mixed feeding. It was noted that wet nursing and expressed breast milk feeding patterns were not practiced by the respondents.

The solution in achieving exclusive breastfeeding goal lies in convincing mothers that breast milk is all that their infant requires in the first six months. In this study the reasons for early initiation of complementary foods were not investigated.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The study revealed that mixed feeding is practiced by both HIV positive mothers and HIV negative mothers and starts soon after delivery. Tendency to mixed feed infants by HIV positive mothers highlights the importance of strengthening infant feeding counselling and follow up support to HIV positive mothers.

7.2 Recommendations

1. Training in HIV and infant feeding counselling is required not only for health workers but also for community volunteers. The Ministry of Health cooperating partners should strengthen the linkage between psychosocial counselling training and PMTCT training so that a health worker or a community volunteer trained in psychosocial counselling should be able to provide infant feeding counselling as well.
2. Exclusive breastfeeding is a better option than mixed feeding thus the problem of compliance need to be addressed through strengthening of infant feeding counselling among HIV positive mothers as well as the general population. Infant feeding counselling should be provided during antenatal and postnatal visits, during children's clinics and whenever a sick infant is brought to hospital or health centre.
3. The Ministry of Health should re launch the Baby Friendly Hospital Initiative (BFHI) in health facilities so as to train more infant feeding counsellors.
4. The PMTCT program should have linkages with communities through support groups composed of HIV positive mothers who are able to provide support to breastfeeding mothers.

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ANNEXES

Annex 1: Permission from District Director of Health (Lusaka) to collect data

Annex 2: Approval from Research and Ethics Committee, UNZA

Annex 3: Participants information sheet

Annex 4: Questionnaire

Annex 1

*in reply please quote
No.....*



Republic of Zambia

MINISTRY OF HEALTH



LUSAKA DISTRICT HEALTH MANAGEMENT TEAM

Tuesday, January 23, 2007

Dr. J. Banda
Department of Community Medicine
University Teaching Hospital
Box 50110
LUSAKA

Dear Sir,

**RE: STUDY ON INFANT FEEDING PRACTICE OF HIV POSITIVE MOTHERS
IN LUSAKA DISTRICT**

I wish to refer to your letter dated 17th January 2007 in which you were seeking permission to carry out the above study.

Management has granted permission for you to conduct the study at Mtendere Health Centre. Please ensure that the results of your findings are available to us.

Best wishes.

Yours sincerely,

**DR. B. TAMBATAMBA
DISTRICT DIRECTOR OF HEALTH – LUSAKA**

C.C.: In-charge – Mtendere Health Centre

Annex 2



THE UNIVERSITY OF ZAMBIA

RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: +260-1-250753
E-mail: unzarec@zamtel.zm

Ridgeway campus
P.O Box 50110
Lusaka, Zambia

Assurance No. FWA00000338
IRB00001131 of IOR0000774

11 December, 2006
Ref: 002-10-06

Dr. John Banda
Department of Community Medicine
University Teaching Hospital
Lusaka

Dear Dr Banda

Re: RESEARCH PROPOSAL: "INFANT FEEDING PRACTICES OF HIV POSITIVE MOTHERS IN LUSAKA DISTRICT"

The above research proposal was presented to the research committee meeting held on 1 November 2006 where changes recommended. We would like to acknowledge receipt of the corrected version with clarifications. The proposal has now been approved. Congratulations!

CONDITIONS:

- This approval is based strictly on your submitted proposal. Should there be need for you to modify or change the study design or methodology, you will need to seek clearance from the research ethics committee.
- If you have need for further clarification please consult this office. Please note that it is mandatory that you submit a final copy of your results at the end of the study.
- Any serious adverse events must be reported at once to this committee.

Yours sincerely,

Prof. J.T. Karashani, MB, ChB, PhD
CHAIRMAN

Dept of Community Medicine
University Teaching Hospital
P.O Box 50110
Lusaka

17th January 2007

To: Research Participant

RE: CONSENT TO PARTICIPATE IN RESEARCH

I am.....a research assistant carrying out a study on infant feeding practices of HIV positive mothers in Lusaka District.

The study will involve asking both HIV positive mothers and non-HIV positive mothers to recall the type of foods they have been giving their infants since birth and what made them decide to feed the infants that particular type of food.

If you are willing to participate in this study please sign below.

Consent

I, have understood the guidelines of the study and do hereby agree to participate in the study.

Signature/thumb print.....

Date:

Questionnaire number:

QUESTIONNAIRE

SURVEY ON THE INFANT FEEDING PRACTICES OF HIV POSITIVE MOTHERS IN LUSAKA DISTRICT

Introduction

This questionnaire is designed to obtain information on infant feeding practices and the types of food to infants born to HIV infected mothers. It is not intended to collect information on the adequacy of infant feeding nor factors that determine type of feeding practice.

The information will be treated with the confidentiality it deserves and will not be used for any other purposes other than those stated above.

Instructions

The questionnaire is divided into eight parts. Tick where appropriate. Some questions require written answers.

Part 1: Socio-demographic data

1. How old are you? (age in completed years)
2. Address
3. What is your marital status?	1. Married 2. Single 3. Divorced 4. Widow 5. Separated
4. Which level of education have you attained?	1. None 2. Primary

5. What is the age of the child? (In months)	3. Secondary 4. Tertiary
6. What is the sex of your child?	1. Male 2. Female
7. What is the birth order of the child?
8. How many children do you have?
9. How many people are in your household?

Part 2: Feeding pattern in the first week of life

16. Did you breastfeed your infant in the first week of life? If no , do not complete the questionnaire If yes , how soon did you put the child to the breast?	1. Yes 2. No 1. Within 1 hour following delivery 2. After 1 hour of delivery
17. Did you give your child anything to eat/drink before s/he was put to breast?	1. Yes 2. No
18. What type of food did you give your child in the first week of life?	1. Water/glucose 2. Tea/juice 3. Formula 4. Cereals/Porridge 5. Vegetables/fruits 6. Other (specify)

Part 3: Current feeding practice

19. Have you given your child any food this week?	1. Yes 2. No
20. If yes , what food did you give your child?	1. Water/glucose 2. Tea/juice

	3. Formula 4. Cereals/Porridge 5. Vegetables/fruits 6. Other (specify)
--	---

Part 4: Wet-nursing practices

<p>22. Has anyone else (besides you) ever breastfeed this infant? If no, go to the next part. If yes, ask the following questions</p> <p>23. Who was this person?</p> <p>24. Number of days this occurred?</p> <p>25. Why did the other person breastfeed your infant?</p>	<p>1. Yes 2. No</p> <p>1. Mother 2. Sister 3. Other (specify) </p> <p>1. Mother ill/weak 2. Breast or nipple difficulty 3. Not enough milk 4. Work 5. Had to go out/be separated from infant 6. Advised by husband 7. Advised by other family member/other people? 8. Did not want to infect infant with HIV 9. Other (specify)</p>
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Part 5: Expressed milk

26. Have you ever expressed your breast milk?	1. Yes 2. No
27. Did you give the expressed milk to your child?	1. Yes 2. No
28. Why did you express milk?	1. To relieve breast pain/engorgement 2. To relieve pain due to cracked nipples 1. Thought milk was bad/unsafe/contaminated 2. To heat-treat before feeding 3. Had to be separated from infant 4. To wean/stop breastfeeding 5. Infant unable to suckle on breast due to illness 6. Other (specify)

Part 6: Maternal Health status

29. Have you ever been sick since delivery?	1. Yes 2. No
If yes , specify illness	3. Don't Know
30. Did you consult a health worker?	1. Yes 2. No
31. Were you admitted?	1. Yes 2. No
32. Did you stop breastfeeding your child during the time of sickness?	1. Yes 2. No

Part 7: Breast health status and breastfeeding condition

33. Since delivery have you had any problem with your breast health?	1. Yes 2. No
34. What breast problems have experienced?	1. Cracked nipples 2. Boil 3. Breast engorgement 4. Rash 5. Ring worm
35. Did you stop breastfeeding?	1. Yes 2. No

Part 8: Infant Health status

36. What is the weight of the child? (in kilograms)
37. Has your child been sick since delivery?	1. Yes 2. No
38. Did you consult a health worker?	1. Yes 2. No
39. Did your child receive treatment?	1. Yes 2. No
40. Was your child admitted?	1. Yes 2. No
41. Did you stop breastfeeding when the child was sick?	1. Yes 2. No