

**A STUDY REPORT ON INFANT  
FEEDING PRACTICES IN THE CONTEXT OF  
HIV / AIDS**

**FINAL REPORT**

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## **LIST OF ACRONYMS**

EBF:	Exclusive Breastfeeding
TRCHS:	Tanzania Reproductive and Child Health Survey
PMTCT:	Prevention of Mother to Child Transmission
IFO:	Infant of HIV Feeding Options
HIV:	Human Immune Deficiency Virus
AIDS:	Acquired Immunity Deficiency Syndrome
VCT:	Voluntary Counseling and Testing
ARVs:	Antiretroviral Reproductive and Child Health
MoH:	Ministry of Health
CDC:	Centre for Disease Control
NACP:	National AIDS Control Programme
MNH:	Muhimbili National Hospital
KCMC:	Kilimanjaro Christian Medical Centre
MRH:	Mbeya Referral Hospital
IDD:	Iodine Deficiency Disorders
UNAIDS:	Joint United Nations on HIV/AIDS
MTCT:	Mother To Child Transmission of HIV
UNICEF:	United Nations Children Fund
WHO:	World Health Organization
KAP:	Knowledge, Altitude and Practice
IYCF:	Infant and Young Feeding
TBA:	Traditional Birth Attendants
VGL:	Village Government Leaders
VHW:	Village Health Workers
FBO:	Faith Based Organization
CBO:	Community Based Organization
HSP:	Health Service Providers

## **EXECUTIVE SUMMARY**

This report presents the findings of a study on infant feeding practices in the context of HIV/AIDS in Tanzania. The study was undertaken from 8<sup>th</sup> – 24<sup>th</sup> August 2004 in 3 regions implementing PMTCT activities namely Kagera, Mbeya and Kilimanjaro. In each region, two PMTCT and one Non-PMTCT implementing districts were involved.

The study population included mothers of infants who are HIV negative, infected and those of unknown status. Others were health service providers dealing with mothers and children, men and women of reproductive age and key informants.

A total of 471 and 95 mothers with their infants were interviewed in PMTCT and Non-PMTCT sites respectively. Also 211 health service providers and 16 key informants were interviewed. HIV positive and negative mothers were selected purposively whereas those of unknown status were selected randomly.

The quantitative data from mothers and health workers were collected by using structured questionnaires. A checklist was used to collect qualitative data from key informants such as TBAs, CBOs, FBOs, VHWs and VGLs. Another checklist was also used for facilitation of focus group discussion which involved men and women of reproductive age. In addition, secondary data from various sources were collected.

The collected data were edited manually before being captured using excel, cleaned and finally transferred into SPSS version 10 for analysis.

The results show that mean age of the interviewed mothers was 25 years and 62.4% of them had more than one child. Most mothers (87.3%) were married and (76.7%) were primary school leavers. There were 40% housewives. Proportion of mothers who delivered at health facility was 76.6%. Many of health service providers interviewed were Nurse Midwives, (45.5%) and nursing officers (21.3%).

As regard to knowledge about breastfeeding, 50% of mothers were able to recognize its nutritional role and 34% knew the importance of colostrums. About breastfeeding initiation, 67.5 percent of mothers reported that it is recommended to start within an hour after delivery. However, a small proportion of mothers (2.5%) and (2.7%) appreciated the advantage of exclusive breastfeeding in relation to family planning and reducing the risk of MTCT of HIV respectively.

Furthermore, 34.5% of mothers mentioned appropriate age for complementation as 4-6 months, where as 32.0% mentioned at 6 months. On the other hand, 24.6% of mothers reported to complement their infants at the age below 4 months. Complementary food given were named as maize porridge (40%), Lishe porridge 2.5% and cow's milk 24%. Findings also show that frequency of feeding

for infants aged 6-9 months as mentioned by 39.8% of mothers was 3 times. However, there were 31.3% mothers who fed their infants 1-2 times a day. With regard to infant aged 10-12 months, the data show that 29.9% and 26.3 percent are fed 3 and 4 times a day respectively. Moreover, 6.0 percent of mothers did not know feeding frequency for infants aged 6-9 months and 9.2% of them were not aware of feeding frequency of infants aged 10-12 months.

As regards to knowledge of mothers on MTCT of HIV, most of the mothers (over 90%), were aware that there is a possibility of MTCT of HIV. The awareness was high (over 90%) among the HIB +ve and HIV-ve mothers within the PMTCT sites. The risk was equally known by majority of mothers even in non-PMTCT sites.

The findings also show that 57% of mothers that the commonest mode of MTCT of HIV is through breastfeeding. Generally in both PMTCT and non PMTCT sites MTCT of HIV through breastfeeding was the way known by many mothers.

Among the mentioned factors that increase the risk of MTCT of HIV were breastfeeding exposure (35.2%), and breast conditions (25.1%). Other factors were sharing clothes between infant and mother; mothers' spits and sweat on the breast during breast-feeding. However, re-infection with HIV and poor breastfeeding technique were less known as they were mentioned factors by 0.3 and 3.6 percent of mothers respectively.

Ways of reducing MTCT of HIV as mentioned by mothers were replacement feeding (62.3%) and avoiding the infants to suckle on a breast with some spits and sweat (16.6%). On the other hand 3.2% of mothers were not aware about any way of reducing MTCT of HIV. However, 1.7 percent and 3.6 percent knew that EBF and ARV respectively could reduce the risk.

In PMTCT sites both HIV infected (69%) and non infected (89%) mothers breastfed their infants soon after delivery. HIV positive mothers who reported to give their infants replacement feed soon after delivery were only 4.8%. The proportion of infants fed on breast milk after delivery was as high 81.1% even among mothers with unknown status.

On top of that the findings also show that health service providers are the important source of information on infant feeding to mothers. They are depended by almost 70% of mothers and their influence as reported by mothers is very high (60.6%). Family members were also mentioned as other source of information.

The main constraints as regard to infant feeding as reported by HIV infected mothers were the refusal of infants to eat other foods, insufficient breast milk and women heavy workload. However, majority of them (71.7%) did not report way constraint.

In additional, the findings revealed that infant feeding counseling was given to majority (76.1%) of HIV infected mothers and only few (24.9%) of HIV negative women. About

49.6% of HIV infected women were counseled on infant feeding option during pregnancy. Those counseled during and after delivery were 21.8% and 28.6% respectively.

The most preferred infant feeding option was early cessation of breast feeding, as it was used by 55.7% of HIV positive women. Other women (17.1 and 14.3%) used exclusive breastfeeding for six months and commercial infant formula respectively. Affordability of infant feeding option was the main motivation (22.9%) to choose and use the said option, as compared to HIV transmission risk reduction (11.0%).

Majority of HIV infected mothers (58.7%) reported to face no constraint as regard to implementation of infant feeding option. However, some of them (12%) mentioned stigma from family and community members as a major constraint to successful implementation of infant feeding option of their choice.

Some health service providers (26.5%) mentioned the 4-6 months duration of exclusive breastfeeding and 46.4% mentioned the WHO / UNICEF recommended duration of 6 months. Furthermore, 13% of HSP were unable to demonstrate proper positioning and attachment of a baby on the breast, and 0.9% were not ware of the appropriate age for complementation.

The findings further show that Few HSP in PMTCT (23%) were aware that there is a possibility of MTCT of HIV during pregnancy. On top of that there were (32.9%) of HSP in PMTCT aware of the increased risk of MTCT of HIV were due to breast conditions, only (4%) of HSP recognized the risk of MTCT associated with poor positioning and attachment of baby on breast. Furthermore, 44% of HSP in PMTCT sites were trained on infant feeding in the context of HIV/AIDS. With regards to infant feeding options 21.3% of The HSP in PMTCT sites mentioned exclusive breastfeeding for 6 months 29.5% mentioned early cessation of breastfeeding. Home prepared infant formula 20.7% and commercial infant formula was given by 15%.

According to HSP in PMTCT sites, the main constraints faced by HIV infected mothers when implementing IFO are stigma (51.1%), avoiding to be known by other family members that they are HIV positive (20%), and switching from one option to another without consultation (22%).

Overall, the study findings show that there is limitation in terms of knowledge and skills on breastfeeding, complementation and infant feeding options among HSP and mothers. More training, sensitization and media campaigns on infant feeding are needed. Counseling services on infant feeding option need to be strengthened. Also more research need to be conducted to explore the risk of MTCT transmission of HIV through the various existing mode of infant feeding among HIV infected mothers.

## **1.0 BACKGROUND:**

Protein Energy Malnutrition (PEM), Nutritional Anaemia, Iodine Deficiency Disorders (IDD) and Vitamin A Deficiency (VAD) are major nutritional problems affecting infants and young children. In Tanzania, according to the 1999 Tanzania Reproductive and Child Health Survey (TRCHS), 5% of the children below five years were wasted, 44% stunted and 29% underweight. Furthermore, the national survey on Vitamin A conducted in 1997 showed that 24.2% of the children under five years of age had VAD.

Infant and young child feeding in Tanzania is mostly dominated by breastfeeding. The TRCHS (1999) showed that, 95% of children were ever breastfed and initiation of breastfeeding within one hour of birth was done by 60% of mothers. It was also noted that, median duration of breastfeeding was 21 months while only 11% were exclusively breastfed (EBF) at 4-6 months.

The survey also showed that early complementation was very common, with about 25% of the infants being complemented at the age of 0-1 month and 50% at 2-3 months. On the other hand, 10% of infants were not complemented at 7 months of age. Similar practice was observed in Asian babies (2004) of same age where about 9% of infants received foods and drinks from bottles. Such feeding practice is not optimal.

The wake of HIV/AIDS has complicated more the infant feeding practices since it has been shown that there is 40% risk of HIV transmission from mother to child when there is no Prevention of Mother to Child Transmission [PMTCT] services. This can occur during pregnancy, delivery and breastfeeding. It is estimated that 5 to 10 percent of HIV transmission will occur during pregnancy, 10 to 15 percent during labour and delivery and 10 to 20 through breastfeeding when continued for 2 years (WHO/UNICEF, 2004).

Tanzania is among the countries with high prevalence of HIV/AIDS. Available information indicates that in Tanzania the MTCT through breastfeeding is estimated at 10.0 percent. In 2002, mother to child transmission accounted for 6% of the reported AIDS cases. Further estimations show that the prevalence of HIV/AIDS among pregnant women attending antenatal sites is 9.6% (NACP, 2002).

Basing on the fact that there is a population of 1.5 million pregnant women annually; 40% risk of HIV transmission from the mother to child when there is no interventions; and a duration of 1-2 years of breastfeeding, approximately 180,000 infants are exposed to the risk of HIV infection thus 72,000 will become HIV infected each year. Furthermore, a third of these children (24,000) will become infected through breastfeeding (MoH / CDC, 2003). This fact has posed a dilemma for the survival and development of children, which largely depend on breastfeeding.

## **1.1 Introduction:**

Tanzania initiated efforts to Prevent Mother to Child Transmission (PMTCT) of HIV in 2000. Five PMCTC sites including 4 referral hospitals (MNH, KCMC, BMC and MRH) and Kagera Regional Hospital were established. One of the components of PMTCT is Infant feeding counseling. As HIV / AIDS is transmissible via breast milk, UNAIDS (2000) recommends that women in developing countries should be given an informed choice of infant feeding options after counseling on infant feeding and HIV. Once the HIV positive women decide whether to breastfeed or put the infant on replacement feeds they should be assisted to implement it successfully. Breastfeeding options include exclusive breastfeeding for six months, early cessation of breastfeeding and expressing and heat treatment of breast milk. Replacement feeds (also known as breast milk substitutes) include commercial infant formula or home prepared formula. Replacement feeding is recommended when there is uninterrupted, accessible supply of formula feeds for at least 6 months; access to safe drinking water; and means to boil water for use in formula preparation and sterile utensils (MoH, 2003).

The PMTCT programme has managed to train trainers and counselors on breastfeeding, HIV and infant feeding from national to lower level. However, training and counseling services on infant feeding issues are inadequate to cover more regions, districts and community (Asia and Nyagawa, 2004).

PMTCT services in Tanzania are provided by different partners with different background. Knowledge and skills of the health workers involved in the provision of such services are thus likely to differ. It has been shown that improper infant feeding practices increase the risk of mother to child transmission of HIV, malnutrition and morbidity among children.

This study therefore seeks to generate information on the existing infant feeding practices in the context of HIV/AIDS in PMTCT and non-PMTCT sites. The information generated will help in planning more focused interventions to promote infant feeding while preventing mother to child transmission of HIV through breastfeeding. The experience acquired by the selected PMTCT sites will be shared with other sites and interested parties who are working towards improving Infant and Young Child Feeding in Tanzania particularly in the wake of HIV/AIDS.

The study findings will also contribute towards standardization of the PMTCT Infant and Young Child Feeding training and education packages, given that actors with different backgrounds are all working towards improved Infant and Young Child Feeding in this era of globalization and HIV/AIDS.

## **1.2 Statement of the problem:**

Analysis of infant and young child feeding practices (IYCF) in Tanzania in the late 1980s and early 1990's identified the following problems.

- Practices of pre-lacteal feeding;
- Delayed initiation of breastfeeding;
- Too early or too late complementation;
- Decline in the intensity and duration of breastfeeding;
- Insufficient food intake and high dietary bulk of complementary foods;
- Women work load particularly during pregnancy;
- Insufficient skills in dealing with breastfeeding and complementary feeding and;
- Lack of information on infant and young child feeding in the context of HIV.

The questions that this study seeks to answer include:

- What are the ongoing infant feeding practices amongst mothers who are HIV ve+, HIV-ve or of unknown HIV status?
- What knowledge do mothers have on optimal breastfeeding and adequate complementation?
- What are KAP of the HIV +ve mothers towards infant feeding options?
- What knowledge and attitude do the HWs have on breastfeeding, complementation, and infant feeding options?
- What support do they give to mothers as regards optimal breastfeeding, complementation and infant feeding options?
- What are the knowledge, attitude and practice amongst community members on infant feeding in general and in relation to HIV/AIDS?
- What is the knowledge and attitude among key informants regards infant feeding in general and in the context of HIV/AIDS?

## **1.3 Rationale of the study:**

Infant and young child feeding practices are important determinants of the health and nutrition status of children below the age of five years. Poor breastfeeding practices especially lack of exclusive breastfeeding during the first 6 months of life and inadequate complementation are important risk factors for infant and childhood morbidity and mortality (WHO / UNICEF 2002).

The dilemma posed by the HIV pandemic and the risk of mother to child transmission (MTCT) of HIV especially through breastfeeding poses special difficulties to infants, women, families, communities, health and other related professionals and the nation at large. Infant and young child feeding, specifically optimal breastfeeding and adequate complementation are questions that have remained unsolved in this era of HIV/AIDS.

The main challenge is how to improve, through optimal feeding the nutritional status, growth and development, health and thus survival of infants' and young children in the given circumstances amidst HIV/AIDS pandemic.

Also, provision of adequate information on existing knowledge and practices on infant feeding amongst the mothers, caretakers, families, communities and other key actors at different levels, especially in PMTCT and non-PMTCT sites should be given priority. This is important if commitment at different levels has to be improved and affirmative action undertaken to improve the infant and young child feeding practices in Tanzania in order to reduce the risk of MTCT of HIV through breastfeeding.

#### **1.4. Study Objectives:**

##### **1.4.1 General Objective**

- To improve Infant feeding practices in the context of HIV/AIDS.

##### **1.4.2 Specific Objectives**

- To assess infant feeding knowledge and practices of HIV- and those of unknown status mothers with children 0-12 months.
- To assess knowledge, attitude and practices of Health Workers on infant feeding in general and Infant Feeding Options.
- To assess knowledge and practices of HIV + mothers with children 0-12 months on Infant Feeding Options in selected PMTCT sites.
- To assess knowledge and practices of other key actors including VHWs, TBAs, parents and Village Council Members on infant feeding.

## 2.0 METHODOLOGY

### 2.1 Study design:

The study was a cross sectional descriptive involving mothers who are HIV + ve, -ve and those of unknown status with infants' aged 0-12 months in PMTCT and non-PMTCT sites. The interviews were also conducted to health workers and key informants on the existing infant feeding practices. Additional information was obtained from women and men of reproductive age during focus group discussions.

### 2.2 Study Areas:

The study was conducted in 3 regions implementing PMTCT activities namely Kagera, Mbeya and Kilimanjaro. A total of 9 districts from these regions were involved where 6 had PMTCT sites and 3 were non-PMTCT. In Kagera region the districts implementing PMTCT were Bukoba Urban and Rural, and non PMTCT was Muleba. Districts in Mbeya for PMTCT were Mbeya Urban and Mbozi and non PMTCT was Tukuyu. Kilimanjaro PMTCT districts were Moshi urban and Hai and non PMTCT was Same. For each region 3 districts were selected where 2 had PMTCT sites and 1 with Non-PMTCT as follows:

<i>Region</i>	<i>Districts</i>	
	<i>PMTCT</i>	<i>NON-PMTCT</i>
Kagera	Bukoba Urban, Bukoba Rural	Muleba
Mbeya	Mbeya Urban, Mbozi	Tukuyu
Kilimanjaro	Moshi Urban, Hai	Same

### 2.3 Study Population:

The study population included:

- HIV negative, positive and unknown status mothers with infants.
- Health service providers dealing with mothers and children in the PMTCT and non PMTCT health facilities.
- Women and men of reproductive age in one of the PMTCT catchment's village.
- Key informants including TBA, Village government leaders, VHW, FBO, CBO in the study sites.

### 2.4 Sample Size:

The study covered 566 mothers with their infants where 471 mothers were from PMTCT and 95 from non-PMTCT sites. The aim was studying a total of 755 mothers of which 225 HIV positive, 225 HIV negative and 225 of unknown status. However, it was impossible for positive and negative mothers because of difficulties in obtaining them. Most of HIV positive mothers had migrated to other settlements, health facilities, and had changed their contact addresses. Also mothers in PMTCT programme

come for routine services with other mothers in the RCH clinics. The change from HBC services to health facility based also contributed to not reaching the targeted sample size, which was determined as follows:

$$\text{Sample size } (n) = \frac{t^2 \times p (100 - p)}{d^2}$$

Whereby:

- $d$  = Level of precision required of the results;
- $t$  = The true prevalence of HIV/AIDS among antenatal women is within the chosen value of  $d$ ;
- $p$  = Estimated percentage of HIV infected antenatal women in the survey area;
- $n$  = Sample size.

Therefore, sample size was obtained as:

Level of precision  $d = 4$

Probability of equivalent of 95% certainty  $t = 2$

The true prevalence of HIV/AIDS among antenatal women is within the chosen value of  $d$ ;  $P \approx 10$

$$(n) = \frac{t^2 \times p (100 - p)}{d^2}$$

$$(n) = 225$$

There were also 211 out of 240 expected health service providers interviewed in which 103 were from PMTCT and 108 non PMTCT sites. This was due to shortage of staff in some health facilities especially in the sections offering services for mothers and children.

A total of 16 key informants were also interviewed while 24 women and 25 men were involved in the focus group discussion. Table 1.1 shows the regions, health facilities and number of mothers studied. Table 1.2 shows the distribution of interviewed mothers in regions for both PMTCT and non PMTCT sites.

**Table 1:1 Regions, health facilities and number of mothers studied in PMTCT and Non PMTCT sites**

<b>PMTCT</b>	<b>Region</b>	<b>Health facility</b>	<b>Respondents</b>	
	Mbeya	Meta	HIV+	7
			HIV-	17
			Unknown	25
		Igawilo	HIV+	10
			HIV-	13
			Unknown	0
		Ruanda	HIV+	18
			HIV-	21
			Unknown	1
		Vwawa	HIV+	2
			HIV-	9
			Unknown	14
	Kagera	Kagera Regional Hospital	HIV+	29
			HIV-	85
			Unknown	14
Kashozi		HIV+	1	
		HIV-	4	
		Unknown	20	
K'njaro	KCMC	HIV+	10	
		HIV-	50	
		Unknown	52	
	Masama RCH	HIV+	3	
		HIV-	14	
		Unknown	6	
Kibong'oto	HIV+	2		
	HIV-	16		
	Unknown	3		
		Pasua	HIV +	3
NON PMTCT	Mbeya	Tukuyu	HIV unknown	40
	Kagera	Rubya	HIV unknown	44
		Katale	HIV Unknown	15
	K'njaro	Same	HIV unknown	11

**Table 1.2: Distribution of interviewed mothers by region in PMTCT and non-PMTCT sites**

<b>REGION</b>	<b>CATEG</b>		<b>TOTAL</b>
	<b>PMTCT</b>	<b>Non - PMTCT</b>	
KILIMANJARO	166	11	177
	35.2%	11.6%	31.3%
KAGERA	168	44	212
	35.7%	46.3%	37.5%
MBEYA	137	40	177
	29.1%	42.1%	31.3%
<b>TOTAL</b>	<b>471</b>	<b>95</b>	<b>566</b>
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

## **2.5 Sampling procedures:**

The survey was done in three PMTCT sites namely KCMC, Mbeya referral Hospital and Kagera regional Hospital. The sites were purposively selected because they had implemented PMTCT services for a long time and the prevalence of HIV/AIDS was high. In all three-survey sites, one district falling outside the PMTCT program catchment area and accessible was purposively selected to participate in the study.

At PMTCT sites all HIV positive and negative mothers with infants who came on the interview day were identified by the health facility staff oriented on the study, using mothers' clinic cards. Respondents were purposively selected because they were few and there after were invited for interview after other services were completed.

The HIV unknown status mothers with infants at both PMTCT and non-PMTCT sites were selected randomly by the same staff. Where the number of such mothers was small, additional respondents were sought from the pediatric and female wards. Mothers' interviews lasted for 30-40 minutes.

At each health facility visited, all willing health service providers from Reproductive and Child Health Clinic, maternity and pediatric wards were interviewed on the mothers health services provided particularly on infant feeding. The interview took 20-30 minutes for each health service provider.

## **2.6 Data collection tools:**

Four types of data collection tools were used. These included two structured questionnaires which were used to collect quantitative data from mothers and health workers in both PMTCT and non-PMTCT sites. These tools collected information on socio-demographic characteristics, knowledge, attitude and practice on breastfeeding, complementation and infant feeding options. In addition, there was a checklist used to collect qualitative data from key informants such as TBA's, CBO's, FBO's, VHW's and VGL's. This collected information on community perception of breastfeeding, complementation and infant feeding in the context of HIV/AIDS. Another checklist was used for facilitation of Focus Group Discussions which involved men and women of reproductive age in PMTCT sites. The content of this checklist was similar to that of the key informants. All the tools had been translated and administered in Kiswahili.

## **2.7 Pre-testing of the Study Tools:**

Pre-testing of the questionnaires for mothers and health workers was done at Tumbi hospital from 20<sup>th</sup> – 24<sup>th</sup> June, 2004 by three members of the research team and a local staff nurse from the hospital. The hospital is one of the PMTCT sites and did not participate in the study. With the assistance of local staff nurse who is also involved in Home-Based Care provision, HIV positive mothers were invited to attend to the clinic within the set dates for interviews. Being in the clinic

with other mothers, they were selected purposively for interview which was conducted in the normal counseling rooms. Mothers of unknown status and those who are HIV negative were selected randomly using their clinic cards. Health workers from antenatal, maternity and postnatal wards were also randomly selected while the three PMTCT staff were purposively selected for interview. The pre-testing team compiled the comments and corrections which were later presented to the main research team. Appropriate corrections were incorporated into the final study tools and some comments were used for logistic purposes.

## **2.8 Data Collection Procedures:**

Fieldwork was conducted from 8<sup>th</sup> – 24<sup>th</sup> August, 2004. They were three teams. Each field team was composed of 2-4 researchers including 2 members from the main research team. The research assistants mainly nurses, were recruited in each region and trained for one day on the objective of the study, administration of the questionnaires for mothers, consent process, confidentiality and research methodology. These assistants were responsible for logistics and interviews for HIV negative mothers and those of unknown status. The field questionnaires were cross - checked every evening for completeness and correctness. One questionnaire was left out due to improper filling. Both health staff and HIV positive mothers were only interviewed by the 2 members from the research team.

At every health facility, respondents were purposively selected using clinic cards that identified the HIV positive and negative mothers. Those of unknown status were randomly selected. All selected participants were invited for interview on normal counseling rooms.

The interviews focused on basic socio-demographic characteristics, knowledge on infant feeding practices, the practices on infant feeding, influences of feeding choices and MTCT of HIV for HIV negative and unknown status mothers. However, there were some additional questions to HIV positive mothers relating to infant feeding options.

Health staff were interviewed on socio-demographic characteristics, knowledge, attitude and practice on general infant feeding, infant feeding options and services provided to mothers.

During the focus group discussion both women and men discussed on community perception about breastfeeding practices, HIV and infant feeding and complementary feeding. Also the key informants were interviewed on similar issues to focus group discussion. The data were recorded on the checklist.

Secondary data from PMTCT sites, MoH, TFNC, NACP and literature review were collected by the research team only. The data were recorded on the researchers' notebooks.

## **2.9 Ethical Consideration:**

The National Medical Research Coordinating Committee of the Ministry of Health approved the study. The Regional Medical Officers for Mbeya and Kagera regions as well as the Director, KCMC made all the logistical arrangements of visiting the sites studied.

All respondents were informed about the nature of the study, its risks and benefits, rights to terminate and confidentiality. Interviews were conducted in Kiswahili. A verbal consent was obtained from each respondent before the administration of the questionnaires, which was done in the usual counseling rooms.

## **2.10 Research Team:**

The research team comprised of nutritionists from Tanzania Food and Nutrition Centre. These have long experience on infant feeding issues. Also they participated from the inception of the study including designing and pre-testing the study tools. The other group was clinicians and nurses with some knowledge on lactation management.

## **2.11 Study Limitation:**

### ***2.11.1. Study Population Sample:***

The study selected mothers who attended reproductive and Child Health Clinics and therefore excluded mothers with similar status who did not attend clinic. It was established that PMTCT services which target HIV+ve mothers are now integrated in the normal RCH services and HIV positive mothers are seen just like other mothers in RCH sites. Although this brought a turn up problem, invitation and mobilization through counselors was done to ensure that a sufficient number of mothers was attained.

### ***2.11.2. The questionnaire:***

The questionnaire asked mothers to recall information given during antenatal and postnatal follow-up clinics. Due to limitation of the recall method, triangulation methods were used. Some cross-check questions were included to verify the information recalled. Also pre-structured questionnaire (quantitative method) was combined with focus group discussions and key informants interview.

## **2.12 Data Processing and Analysis:**

### ***2.12.1 Manual editing:***

Manual editing of the filled in questionnaires was done by the research team and enumerators every evening after the field work. This minimized impossible responses, omissions and inconsistencies. For open ended questions coding of answers was done after completion of the field work to facilitate data entry.

Data capture format using excel was designed and data were entered and cleaned for inconsistencies, incorrect values and double entries. The data were then transferred to SPSS (version 10) for analysis.

**2.13 Data Processing and Analysis:**

Analysis was guided by the prior tabulation plan in which frequencies; means, cross tabulation were computed.

### **3.0 RESULTS AND DISCUSSION:**

The data from mothers and health service providers in both PMTCT and non-PMTCT are reported together. The data showing differences in both groups are highlighted. Information from key informants and focus group discussion has been used for discussion. The results are discussed according to the study objectives. However, the data set is available for further analysis.

#### **3.1 Respondents characteristics:**

The most important characteristics describing the mothers are presented in table 2.0. A total of 25 HIV positive, 80 HIV negative and unknown status mothers were interviewed in Kilimanjaro region. In Kagera, 30 HIV positive, 89 HIV negative and 93 HIV unknown status mothers were studied. Moreover, 37 HIV positive, 60 HIV negative and 80 unknown status mothers were interviewed in Mbeya region. In total, 92 HIV positive, 229 HIV negative and 245 HIV unknown status mothers were interviewed. Data in table 2.1 show that mean age of the mothers was 25.5 years and most of them (62.4%) had more than one child. In both PMTCT and non-PMTCT, most mothers (87.3%) were married and the majorities (76.7%) were primary school leavers. Moreover, about 40.0 percent of the mothers interviewed were housewives. The table also shows that most mothers (88.5%) delivered in a normal way, while 78.6 percent delivered at health facility.

On the other hand, a total of 54, 78 and 79 health service providers were interviewed in Kilimanjaro, Kagera and Mbeya sites respectively. The majority of the health service providers (64.9%) were working in the MCH clinic, maternity and pediatric wards. Among them, 45.5 percent were nurse midwives and nursing officers were 21.3 percent. Female health service providers were the majority (90.0%) and 57.3 percent of all health service providers interviewed had college education.

**Table 2.0: Socio – demographic characteristics of respondent mothers in PMTCT and Non PMTCT**

Descriptor	PMTCT (n=471)			Non PMTCT (n=95)	Total (n=566)
	HIV +	HIV -	Unknown		
Mean age (yrs)	27.28	25.53	25.76	23.68	25.5
Mean number of children	2.49	2.15	2.40	2.20	2 (62.4%)
Number of pregnancy	2.92	2.46	2.71	2.49	2 (68.6%)
Marital status					
• Single	14 (15.2%)	14 (6.1%)	18 (12.0%)	7 (7.4%)	53 (9.4%)
• Married	69 (75.0%)	209 (91.3%)	130 (86.7%)	86 (90.5%)	494 (87.3%)
• Divorced	4 (4.3%)	3 (1.3%)	2 (1.3%)	1 (1.1%)	10 (1.8%)
• Widow	5 (5.4%)	3 (1.3%)	0 (0.0%)	1 (1.1%)	9 (1.6%)
Education Level					
• None	9 (9.8%)	8 (3.5%)	10 (6.7%)	6 (6.3%)	33 (5.8%)
• Primary School	71 (77.2%)	167 (72.9%)	114 (76.0%)	82 (86.3%)	434 (76.7%)
• Secondary School	10 (10.9%)	43 (18.8%)	22 (14.7%)	7 (7.4%)	82 (14.5%)
• Tertiary	2 (2.2%)	10 (4.4%)	3 (2.0%)	0 (0.0%)	15 (2.7%)
• Others	0 (0.0%)	1 (0.4%)	1 (0.7%)	0 (0.0%)	2 (0.4%)
Occupation					
• Housewife	36 (39.6%)	106 (46.3%)	52 (34.7%)	30 (31.6%)	224 (39.6%)
• Employed	3 (3.3%)	19 (8.3%)	12 (8.0%)	0 (0.0%)	34 (6.0%)
• Peasant	31 (33.7%)	42 (18.3%)	51 (34.0%)	44 (46.30%)	168 (29.7%)
• Business	14 (15.2%)	36 (15.7%)	22 (14.7%)	19 (20.0%)	91 (16.1%)
• Others	8 (8.7%)	26 (11.4%)	13 (8.7%)	2 (2.1%)	49 (8.7%)
Delivery method					
• Normal	85 (92.4%)	191 (83.4%)	137 (91.3%)	88 (92.6%)	501 (88.5%)
• Caesarean section	7 (7.6%)	38 (16.6%)	13 (8.7%)	7 (7.4%)	65 (11.5%)
Delivery place					
• Home	13 (14.1%)	22 (9.6%)	29 (19.3%)	28 (29.5%)	92 (16.3%)
• Health facility	74 (80.4%)	203 (88.6%)	118 (78.7%)	50 (52.6%)	445 (78.6%)
• TBA	15 (5.4%)	4 (1.7%)	3 (2.0%)	17 (17.9%)	29 (5.1%)

### **3.2: Breastfeeding:**

All mothers were asked on some specific issues regarding breastfeeding. The mothers' responses presented in Table 3 show that nutritional role of breastfeeding; colostrum and exclusive breastfeeding are in general known by less than 50% of mothers. Also 11.8 percent of mothers appreciate the psychological bonding due to breastfeeding. However; there are a significant proportion of mothers (8.4 percent) who did not know any advantage of breastfeeding.

The nutritional and protective importance of colostrum was mentioned by 34.0 and 21.8 percent of mothers. While 5.6 percent said colostrum has no importance, 36.0 percent did not know any importance of colostrum.

With regard to breastfeeding initiation, 67.5 percent of mothers reported that it is recommended to start within an hour of birth, 6.9 percent did not know when initiation could be done.

About 34.0 percent of mothers mentioned that exclusive breastfeeding duration is less than 4 months. While 31.4 percent mentioned the duration of 4-6 months, 4.9 percent did not know how long the infant can depend on breast milk and only 27.7 percent were aware of duration of 6 months.

The table further shows that 40.3 percent of mothers know the nutrition advantage of exclusive breastfeeding. However, only a small proportional of mothers (2.5%) and (2.7%) mentioned advantages of EBF in relation to family planning and reducing the risk of MTCT of HIV respectively.

**Table 3: Knowledge of respondent mothers on breastfeeding in PMTCT and Non-PMTCT**

Descriptor	PMTCT			Non PMTCT	Total
	HIV+	HIV-	Unknown		
Advantage of breastfeeding:					
• Nutritious	64 (69.9%)	186 (81.2%)	117 (78.0%)	75 (78.9%)	443 (45.8%)
• Family Planning	5 (5.4%)	10 (1.4%)	6 (4.0%)	1 (1.1%)	225 (23.5%)
• Economic			1 (0.7%)		30 (3.1%)
• Psychological		5 (2.2%)	5 (3.5%)	5 (5.3%)	44 (4.5%)
• Others		28 (12.2%)	21 (14.0%)	14 (14.7%)	114 (11.8%)
• Do not know	18 (19.6%)				27 (2.8%)
Importance of colostrum:					
• Nutritious	40 (43.5%)	96 (41.9%)	60 (40.0%)	30 (3.6%)	226 (34.0%)
• Protection	1 (1.1%)	21 (9.2%)	17 (11.3%)	11 (11.6%)	145 (21.8%)
• Others	3 (3.3%)	6 (2.6%)	11 (2.7%)	2 (2.1%)	18 (2.7%)
• No importance	2 (2.20%)	5 (2.2%)	11 (7.3%)	18 (18.9%)	37 (5.6%)
• Do not know	46 (50.0%)	44 (44.1%)	58 (38.7%)	34 (35.8%)	239 (35.9%)
Initiation of breastfeeding:					
• Within 1 hours	54 (58.7%)	175 (76.4%)	87 (58.0%)	66 (69.5%)	382 (67.5%)
• 2-6 hours	8 (8.7%)	23 (10.0%)	21 (14.0%)	18 (48.9%)	70 (12.4%)
• After 6 hours	5 (5.4%)	14 (6.1%)	16 (10.7%)	9 (9.5%)	44 (7.8%)
• Others	8 (8.7%)	6 (2.6%)	16 (10.7%)	1 (1.1%)	31 (5.5%)
• Do not know	8 (18.7%)	11 (4.8%)	10 (6.7%)	1 (1.1%)	39 (6.9%)
Duration of EBF:					
• 4-6 months	35 (38.0%)	65 (28.4%)	56 (37.3%)	38 (40.0%)	9 (34.3%)
• 6 months	27 (29.3%)	65 (28.4%)	54 (36.0%)	3 (3.0%)	178 (31.4%)
• Others	20 (21.7%)	82 (35.8%)	33 (22.0%)	22 (23.2%)	57 (27.7%)
• Do not know	2 (2.2%)	5 (2.2%)	2 (1.1%)	3 (3.2%)	9 (1.6%)
	7 (8.7%)	12 (5.20%)	3 (3.3%)		28 (4.9%)
Advantage of EBF:					
• Nutritious	43 (46.7%)	142 (62.0%)	84 (56.0%)	53 (55.8%)	322 (40.3%)
• Family Planning					20 (2.5%)
• Reduced risks of MTCT of HIV	8 (8.7%)	2 (0.9%)			22 (2.7%)
• Reduce costs	8 (8.7%)	1 (0.4%)	2 (1.3%)		54 (6.7%)
• Reduced risks of infections		2 (0.9%)	6 (4.6%)		
• Others	9 (9.8%)	15 (6.6%)	3 (2.0%)	3 (3.2%)	172 (21.5%)
• Do not know	24 (26.1%)	55 (24.0%)	17 (11.3%)	4 (4.2%)	56 (7.0%)
			38 (25.3%)	35 (36.8%)	153 (19%)

**Discussion:**

Knowledge of mothers on breastfeeding is very important factor for the mother to make a decision on infant feeding option. The findings show that the nutritional advantage of breastfeeding is known by less (69.9%) HIV + mothers compared to about 80 percent of other mothers (i.e. HIV - and unknown status). In normal circumstances, we expected that HIV+ mothers in PMTCT would be more knowledgeable than the rest. In all groups of mothers the duration of exclusive breastfeeding of 4-6 months was known by less than 50.0 percent. This implies that the knowledge of exclusive breastfeeding duration among mothers is still

limited. This also applies on the advantage of exclusive breastfeeding especially the nutrition part, which is more known by over 55.0 percent of HIV negative and unknown status mothers. However, more (8.7%) HIV+ mothers than 1.0 percent in approximation of other group of mothers were aware that exclusive breastfeeding reduces the risk of MTCT of HIV. Across all groups, more than 24.0 percent of mothers did not know any advantage of exclusive breastfeeding. This situation calls for a need to intensify education on breastfed including exclusive breastfeeding among community members particularly the mothers.

### **3.3 Complementary Feeding:**

Mothers were asked on some selected complementary feeding issues which are presented in Table 4. The data show that 34.5 and 32.0 percent of the mothers responded that appropriate age for complementary feeding was between 4-6 months and at 6 months respectively. There were 24.6 percent of mothers who said that they complimented their infants below 4 months of age and 3.0 percent did not know when to compliment. With regard to foods usually given when infants start being complemented; about 40.0 percent of mothers mentioned maize porridge. Lishe porridge (mixture of legumes, nuts, and cereals) was mentioned by 25.4 percent and cow's milk was mentioned by 24.0 percent. The table further shows that infants aged 6-9 months are fed 3 times (39.8%) and 31.3 percent are given food 1-2 times a day. Those aged 10-12 months; the data show that 29.9 and 26.3 percent are fed 3 and 4 times a day respectively. Moreover, 6.0 percent of mothers did not know feeding frequency for infants 6-9 months and 9.2 percent for infants aged 10-12 months.

**Table 4: Knowledge of Respondent mothers on complementary feeding in PMTCT and non-PMTCT sites**

Descriptor	PMTCT			Non-PMTCT Unknown	Total (n=560)
	HIV+	HIV-	Unknown		
Age of Complementation					
• Below 4 months	20 (21.7%)	51 (22.3%)	36 (24.0%)	32 (33.7%)	139 (24.6%)
• 4-6 months	34 (37.0%)	72 (31.4%)	57 (38.0%)	32 (33.7%)	195 (34.5%)
• At 6 months	32 (34.8%)	79 (34.5%)	46 (30.7%)	24 (25.3%)	181 (32.0%)
• After 6 months	2 (2.2%)	19 (8.3%)	2 (1.3%)	3 (3.2%)	26 (4.6%)
• Others	1 (1.1%)	2 (0.9%)	5 (3.3%)	0 (0.0%)	8 (1.4%)
• Do not know	3 (3.3%)	6 (2.6%)	4 (2.7%)	4 (4.2%)	17 (3.0%)
<b>Total</b>	<b>92 (100.00%)</b>	<b>229 (100.0%)</b>	<b>150 (100.9%)</b>	<b>95 (100.0%)</b>	<b>566 (100.0%)</b>
Foods given when complementation starts					
• Cow's milk	25 (27.2%)	65 (28.4%)	32 (21.3%)	14 (14.7%)	136 (24.0%)
• Maize porridge	32 (34.8%)	89 (38.9%)	63 (42.0%)	41 (43.2%)	225 (39.8%)
• Lishe porridge	24 (26.1%)	60 (26.1%)	35 (23.3%)	25 (26.3%)	144 (25.4%)
• Soft Ugali	4 (4.3%)	5 (2.2%)	5 (2.2%)	0 (0.0%)	14 (2.5%)
• Mashed meet potatoes	2 (2.2%)	1 (0.4%)	2 (1.3%)	2 (2.1%)	7 (1.2%)
• Mashed banana	2 (2.2%)	4 (1.7%)	7 (4.7%)	12 (12.6%)	25 (4.4%)
• Others	1 (1.1%)	5 (2.2%)	6 (4.0%)	1 (1.1%)	13 (2.3%)
• Do not know	2 (2.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.4%)
<b>Total</b>	<b>92 (100.00%)</b>	<b>229 (100.0%)</b>	<b>150 (100.9%)</b>	<b>95 (100.0%)</b>	<b>566 (100.0%)</b>
Feeding frequency at 6-9 months infants age					
• 1-2	21 (22.8%)	63 (27.5%)	42 (28.0%)	51 (53.7%)	177 (31.3%)
• 3	38 (41.3%)	102 (44.5%)	60 (40.0%)	25 (26.3%)	225 (39.8%)
• 4	14 (15.2%)	36 (15.7%)	26 (17.3%)	13 (13.7%)	89 (15.7%)
• 5 or more	10 (10.9%)	19 (8.3%)	11 (7.3%)	1 (1.1%)	41 (7.2%)
• Do not know	9 (9.8%)	9 (3.9%)	11 (7.3%)	55.3%	34 (6.0%)
<b>Total</b>	<b>92 (100.00%)</b>	<b>229 (100.0%)</b>	<b>150 (100.9%)</b>	<b>95 (100.0%)</b>	<b>566 (100.0%)</b>
Feeding frequency at 10-12 months infants age					
• 1-2	14 (15.2%)	26 (11.4%)	21 (14.0%)	31 (32.6%)	92 (16.3%)
• 3	19 (20.7%)	84 (36.7%)	35 (23.3%)	31 (32.6%)	169 (29.9%)
• 4	24 (26.1%)	65 (28.4%)	48 (32.0%)	12 (12.6%)	149 (26.3%)
• 5 or more	23 (25.0%)	37 (16.2%)	28 (18.7%)	16 (16.8%)	104 (18.4%)
• Do not know	12 (13.0%)	17 (7.4%)	18 (12.0%)	5 (5.3%)	52 (9.2%)
<b>Total</b>	<b>92 (100.00%)</b>	<b>229 (100.0%)</b>	<b>150 (100.9%)</b>	<b>95 (100.0%)</b>	<b>566 (100.0%)</b>

### Discussion:

Timely complementary feeding is crucial for good nutrition status of children. The data on age of complementation show that, 21.7 percent of HIV+ mothers complement their children at below 4 months of age as opposed to more than 25.0 percent of HIV negative and unknown status mothers. This means that many mothers regardless of their HIV status, start complementing their children after 6 months. The available literature recommends that the children should start being complemented at 6 months. This was found to be a good practice. Complementary foods differ from place to place. In this case, it was observed that cow's milk was common but it was given by fewer mothers (14.7%) in Non-PMTCT than PMTCT sites (>20%). Maize porridge was given by less than 50.0 percent of mothers across all groups. It was surprising to find that 2.2 percent of the HIV mothers did not know what foods to give children during complementation.

Infants are recommended to be fed more than five times a day. The findings have shown that there is under feeding practices where by only 11.0 percent of HIV+ mothers and up to 11 percent of other group of mothers feed their children 5 or more times a day. This also was observed on the age group of 10-12 months.

### **3.4 MTCT of HIV:**

The level of knowledge of mothers as presented in Table 5 on MTCT of HIV is quite important if the mothers who are the frontline caretakers have to spearhead actions aimed at reducing MTCT of HIV. As regards to knowledge of mothers on MTCT of HIV, most of the mothers (over 90%), were aware that there is a possibility of MTCT of HIV. This awareness was also found to be high (over 90.0%) among the HIV+ and HIV- mothers within the PMTCT sites. On the other hand, non PMTCT sites were aware about MTCT of HIV.

Concerning ways of MTCT of HIV, Fifty seven percent (57.0%) of the responses mentioned through breastfeeding and 23.0 percent during delivery. Generally, in both PMTCT and Non-PMTCT sites MTCT of HIV during breastfeeding was the way known by many mothers.

Factors likely to increase the risk of MTCT of HIV were breastfeeding exposure (35.2%) and breast conditions (25.1%) which were mentioned as obvious factors to the mothers. Other factors mentioned were sharing clothes between infant and a mother and 23.8 percent said that mother's spits and sweat on the breast during breastfeeding could also increase the risk. Re-infection and poor positioning and attachment were less known factors by 0.3 and 3.6 percent of mothers respectively.

Regarding ways of reducing MTCT of HIV, most of the mothers (62.3%) mentioned replacement feeding as the best way of reducing MTCT of HIV. Also, 16.6 percent of mothers said that there were other ways of reducing the risk such as mothers avoiding the infants to suckle on a breast with some spits and sweat. Furthermore, 3.2 percent of the mothers did not know any way of reducing MTCT of HIV. It was found that only 1.7 percent and 3.6 percent of mothers knew that EBF and ARV respectively could reduce the risk of MTCT of HIV.

**Table 5. Knowledge of mothers on MTCT of HIV in PMTCT and Non-PMTCT sites by HIV status**

Descriptor	PMTCT			Non-PMTCT	
	HIV+	HIV-	Unknown status		
a) Possibility of MTCT of HIV					
• Yes	87 (94.6)	219 (95.6)	127 (84.7)	79 (83.2)	512 (90.5)
• No	5 (5.4)	10 (4.4)	23 (15.3)	16 (16.8)	54 (9.5)
Total	92 (100.0)	229 (100.0)	150 (100.0)	95 (100.0)	566 (100.0)
b) Way of MTCT					
• During pregnancy	20 (13.8%)	59 (16.0%)	27 (14.5%)	27 (23.1%)	133 (16.2)
• During delivery	41 (28.3%)	97 (26.1%)	35 (18.8%)	16 (13.7%)	189 (23.1)
• During breastfeeding	77 (53.1%)	202 (54.4%)	122 (65.6%)	66 (56.4%)	467 (57.0)
• Others	7 (4.8%)	13 (3.5%)	2 (1.1%)	8 (6.8%)	30 (3.7)
Total Responses	45	371	186	117	819 (100.0)
c) Factors increasing the risk of MTCT of HIV					
• Breast condition	28(27.0%)	72 (26.7%)	38 (23.8%)	15 (19.7%)	153 (25.1)
• Viral load	1 (0.9%)	17 (6.3%)	8 (5.0%)	4 (5.3%)	30 (4.9%)
• Poor positioning and attachment	1 (0.9%)	12 (4.4%)	9 (5.6%)	0 (0)	22 (3.6%)
• Mixed feeding	20 (19.2%)	18 (6.7%)	1 (0.6%)	0 (0)	40 (6.6%)
• Breastfeeding exposure	22 (21.2%)	89 (33.0%)	71 (44.4%)	11 (44.0)	215 (35.2%)
• Re-infection	1 (0.9%)	1 (0.4%)	0 (0.0%)		2 (.3%)
• Others	31 (29.9%)	59 (21.8%)	32 (20.0%)	5 (20.0)	145 (23.8%)
• Do not know	0 (0.0%)	2 (0.7%)	1 (0.6%)	0 (0)	3 (0.5%)
Total Responses	104	270	160	76	610
d) Ways of reducing MTCT of HIV					
• Avoid mixed feeding					
• Replacement	4 (5.0%)	9 (4.4%)	0 (0.0%)	0 (0.0%)	13 (2.7%)
• Early cessation of breastfeeding	34 (42.5%)	125 (60.7%)	89 (72.9%)	48 (71.6%)	296 (62.3%)
• EBF	10 (12.5%)	8 (3.9%)	3 (2.5%)	1 (1.5%)	22 (4.6%)
• ARV	4 (5.0%)	4 (1.9%)	0 (0.0%)	0 (0.0%)	8 (1.7%)
• Advice from health personnel	4 (5.0%)	8 (3.9%)	3 (2.5%)	2 (3.0%)	17 (3.6%)
• Do not know	4 (5.0%)	14 (6.8%)	2 (1.6%)	5 (7.5%)	25 (5.3%)
• Others	6 (7.55)	5 (2.4%)	1 (0.8%)	3 (4.5%)	15 (3.2%)
	14 (17.5%)	5 (2.4%)	24 (19.7%)	8 (11.9%)	79 (16.6%)
Total Responses	80	206	122	67	475

**Discussion:**

Mother to Child Transmission of HIV is one of the major ways of transmission in the country. The understanding that HIV can be transmitted from the mother to the child was found to be very high (94.6 %) in HVI+ mothers and over 80.0 percent in other groups. In both groups the fact that HIV can be transmitted through breastfeeding was known by over 50.0 percent of all mothers interviewed. However, the majority (65.6%) of unknown status mothers were aware that during breastfeeding HIV can be transmitted.

On the factors increasing the risk of transmission, only 0.9 percent of HIV+ mothers were aware that viral load could increase the chances of transmission. This was found to be high on the rest of mothers where more than 5.0 percent were aware of this factor.

Mixed feeding as a factor that increases the risk of MTCT was highly known (19.2%) among HIV+ mothers as compared to less than 7.0 percent of the negative and unknown status mothers. The knowledge of mothers on breastfeeding exposure as one of the risk factors was mentioned by 21.2 percent of the HIV+ mothers and by over 30.0 percent of other mothers. This information shows that, knowledge of HIV+ mothers on some MTCT risk factors is somehow low. There is some information on PMTCT of HIV in Non-PMTCT sites as well. However, there is a need of providing more focused information on MTCT to the HIV+ mothers in order to reduce the risk of transmission. This need is evidenced by response of mothers on ways of reducing MTCT of HIV where avoiding mixed feeding was mentioned by 5.0 percent of HIV + mothers and even less than that in the other group. Replacement feeding was known by over 60.0 percent of HIV negative and unknown status mothers as compared to 42.5 percent of HIV+ mothers.

On the other hand, it was interesting to find that early cessation of breastfeeding and exclusive breastfeeding were more known (12.5 and 5.0% respectively) by HIV+ mothers. This was different in other group where less than 4.0 percent and 2.0 percent respectively mentioned early cessation and exclusive breastfeeding as possible ways of reducing the transmission.

### 3.5 Infant Feeding:

All mothers were asked about breastfeeding frequency in normal situation, feeds given to the infants soon after delivery and after how long and what the index child was fed yesterday. They were also asked about feeding methods used yesterday and breastfeeding frequency for those who did it.

As can be seen in Table 6 below, most mothers (83.0%) fed their infants on breast milk of which 31.3 percent did so within an hour after delivery. The most used food to feed the infants on the day before interview was breast milk. For mothers who were breastfeeding, majority (90.0%) breastfed their infants in average 10 times. The data also show that suckling method was the highest used (35.0%) followed by cup feeding (33.2%) and bottle feeding (26.9%).

**Table 6: Response of mothers on infant feeding, how long and frequency soon after delivery in PMTCT and non PMTCT Sites**

Descriptor	PMTCT			Non-PMTCT Unknown	Total (n=560)
	HIV+	HIV-	Unknown		
What infants fed after delivery					
• Breastfeeding	69 (75.0%)	204 (89.1%)	120 (80.0%)	77 (81.1%)	470 (83.0%)
• Replacement feeds	14 (15.2%)	11 (4.80%)	5 (3.3%)	2 (2.1%)	32 (5.7%)
• Plain water	9 (9.8%)	14 (6.1%)	24 (16.0%)	16 (16.8%)	63 (11.1%)
• Do not remember	0 (0.0%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	1 (0.2%)
Total	92 (100.00%)	229 (100.0%)	150 (100.9%)	95 (100.0%)	
Infant fed how long after delivery					
• Within an hour	46 (50.0%)	170 (74.2%)	97 (28.0%)	51(53.7%)	177 (31.3%)
• 2-6 hours	19 (20.7%)	27 (11.8%)	60 (40.0%)	25 (26.3%)	225 (39.8%)
• After 6 hours	24 (26.1%)	20 (8.7%)	26 (17.3%)	13 (13.7%)	89 (15.7%)
• Do not remember	3 (3.3%)	12 (5.2%)	11 (7.3%)	1 (1.1%)	41 (7.2%)
Total	92 (100.00%)	229 (100.0%)	150 (100.9%)	95 (100.0%)	
Feeding frequency at 10-12 months infants age					
• Cup	45 (48.9%)	71 (31.0%)	50 (33.3%)	22 (23.2%)	188 (33.2%)
• Bottle	7 (7.6%)	4 (1.7%)	4 (2.7%)	5 (5.3%)	20 (3.5%)
• Spoon	14 (15.2%)	52 (22.7%)	42 (28.0%)	44 (46.3%)	152 (26.9%)
• Hand	2 (2.2%)	1 (0.4%)	2 (1.3%)	0 (0.0%)	5 (0.9%)
• Suckling	23 (25.0%)	99 (43.2%)	52 (34.7%)	24 (25.3%)	198 (35.0%)
• Others	1 (1.1%)	2 (0.9%)	0 (0.0%)	0 (0.0%)	3 (0.5%)
Total	92 (100.00%)	229 (100.0%)	150 (100.9%)	95 (100.0%)	

### Discussion:

Breast milk or some milk is very important in the early stages of life. This goes hand in hand with early initiation of breastfeeding as well as feeding frequency. On this regard, it was found that 11.1 and 5.7 percent of infants were given plain water and replacement feeds soon after being born. The provision of plain water ranged from 9.8 percent of HIV + mothers to about 17.0 percent in the other group.

Also about 40.0 percent of mothers initiated feeding 2-6 hours after delivering. This is far from the recommended period of within an hour after delivery. Such delays could have contributed to the provision of plain water and replacement feed observed in the study. It was interesting to find that breastfeeding is still the most used feeding option regardless of the HIV status with 75.0 percent of HIV+ mothers and over 80.0 percent of negative and unknown status mothers.

Although bottle-feeding has been discouraged due to difficult in cleaning and hence easy contamination, 3.5 percent of the mothers were still practicing it. There were 15.2 percent of HIV + mothers using bottle feeding compared to over 20.0 percent of other group. This figure is a little bit higher than the national one which shows that about 9.0 of all infants receive food and drinks from bottles. (Nyangawa, 2004).

### 3.6 Influence on Infant Feeding Decision:

The results of source of information on infant feeding and influence on feeding practices are presented in Table 7. In this table the data clearly show that health service providers are the most (69.6%) source of information on infant feeding to the mothers. The health service providers are also the most (60.6%) influencers to mothers on their infants feeding decision. On the other hand, family members (15.4%) also provide some information on infant feeding and influence mothers (20.3%) on their decision on what to feed the infants.

**Table 7: Influence on mothers' infant feeding decision in PMTCT non-PMTCT sites**

Descriptor	PMTCT			Non - PMTCT	Total (n=556)
	HIV +	HIV -	Unknown		
Source of information on infant feeding					
• Health service providers	85 (92.4%)	168 (73.4%)	89 (59.3%)	52 (54.7%)	394 (69.6%)
• CBOs	0 (0.0%)	8 (3.5%)	4 (2.7%)	8 (8.4%)	20 (3.5%)
• In Laws	0 (0.0%)	12 (5.2%)	5 (3.3%)	6 (6.3%)	23 (4.1%)
• Family members	2 (2.2%)	25 (10.9%)	41 (27.3%)	19 (20.0%)	87 (15.4%)
• Others	5 (5.4%)	16 (7.0%)	11 (7.3%)	10 (10.5%)	42 (7.4%)
Influence on infant feeding decision					
• Health service providers	73 (79.3%)	145 (63.3%)	79 (52.7%)	46 (48.4%)	343 (60.6%)
• CBOs	3 (3.3%)	9 (3.9%)	4 (2.7%)	6 (6.3%)	22 (3.9%)
• In laws	2 (2.2%)	17 (7.4%)	7 (4.7%)	7 (7.4%)	33 (5.8%)
• Family members	4 (4.3%)	43 (18.8%)	42 (28.0%)	26 (27.4%)	115 (20.3%)
• Others	10 (10.9%)	15 (6.6%)	18 (12.0%)	10 (10.5%)	53 (9.4%)

### Discussion:

The findings have shown clearly that health service providers are the most sources of information and influencers (92.4% and 79.3% respectively) of mothers on their infant feeding issues. On the other hand, family members have more information and influence on HIV-ve and unknown status mothers on infant feeding decision as compared to less than 5.0 percent in HIV+ mothers. This also applies to other group where HSP play over 50.0 percent. This information underscores the roles of HSP and family members on mothers' infant feeding decision. These findings were similar to a study conducted in Kwazulu – Natal (2003) where clinic based health service providers were reported to be the most important sources of infant feeding information both antenatal and postnatal in PMTCT and non-PMTCT sites. It is therefore important to equip well HSP with correct information on infant feeding if success has to be realized. Family members especially those staying together with such mothers need also to be given targeted information with regard to infant feeding choice of the mother. This could be done during infant feeding counseling and shortly before the mother is discharged after delivery.

### 3.7 Constraints and suggestions:

All mothers were asked about the constraints faced, if any, during infant feeding. They were further requested to give suggestion on how to improve infant feeding in a normal situation where HIV/AIDS is not considered. Table 8 below shows that 84.5 percent of mothers did not face any constraints with regard to infant feeding in ideal situation. Those who face constraints mentioned them as infants' refusal to consume other types of foods (42.0%) and low income for purchasing cow's milk and other foods (17.0%). Many mothers (36.4%) suggested that in order to improve infant feeding in ideal situation, infant feeding education should be given to all mothers during their clinic visits. However, there were 33.0 percent of mothers who did not suggest anything meaning that everything regarding infant feeding practices was fine.

**Table 8: Constraints faced by mothers and their suggestions on improving infant feeding in PMTCT and non-PMTCT sites**

Descriptor	PMTCT			Non - PMTCT	Total (n=556)
	HIV +	HIV -	Unknown		
Mothers faced infant feeding constraints					
• Yes	26 (28.3%)	29 (12.7%)	21 (14.0%)	12 (12.6%)	88 (15.5%)
• No	66 (71.7%)	200 (87.3%)	129 (89.0%)	83 (87.4%)	478 (84.5%)
Total	92 (100.0%)	229 (100.0%)	150 (100.0%)	95 (100.0%)	566 (100.0%)
Constraints mentioned					
• Women workload	1 (3.8%)	2 (6.9%)	5 (23.8%)	0 (0.0%)	8 (9.1%)
• Infants refusal to eat other foods	4 (15.4%)	15 (51.7%)	10 (47.6%)	8 (66.7%)	37 (42.0%)
• Insufficient breast milk due to poor health status of mother	2 (7.7%)	4 (13.8%)	2 (9.5%)	0 (0.0%)	8 (9.1%)
• Low income for purchasing cow's milk and	11 (12.3%)	2 (6.9%)	1 (4.8%)	1 (8.3%)	15 (17.0%)

other food					
• Unreliable source of cow's milk	3 (11.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (3.4%)
• Infant poor weight gain	1 (3.8%)	290 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.1%)
• Lack of infant feeding education	1 (3.8%)	0 (0.0%)	1 (4.8%)	0 (0.0%)	2 (2.3%)
• Others	3 (11.5%)	6 (20.7%)	22 (9.5%)	3 (25.0%)	14 (15.9%)
Total	26 (100.0%)	29 (100.0%)	21 (100.0%)	12 (100.0%)	88 (100.0%)
Suggestion of improving infant feeding					
• Infant feeding education during clinic	30 (32.6%)	98 (42.8%)	59 (39.3%)	19 (20.0%)	206 (36.4%)
• Mothers testing for HIV	1 (1.1%)	3 (1.3%)	1 (0.7%)	0 (0.0%)	5 (0.9%)
• EBF for 6 months followed by replacement feeding	8 (8.7%)	29 (12.7%)	16 (0.7%)	11 (11.6%)	64 (11.3%)
• Commercial infant formula aid	9 (9.8%)	6 (2.6%)	3 (2.0%)	1 (1.1%)	19 (3.4%)
• Loans for petty business	5 (5.4%)	3 (1.3%)	2 (1.3%)	2 (2.1%)	12 (2.1%)
• No suggestion	33 (35.9%)	61 (26.6%)	51 (34.0%)	42 (44.2%)	187 (33.0%)
• Not breastfeeding for HIV+ mothers	2 (2.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.4%)
• Family planning	0 (0.0%)	7 (3.1%)	4 (2.7%)	10 (10.5%)	21 (3.7%)
• Good maternal nutrition	4 (4.3%)	22 (9.6%)	14 (9.3%)	10.10.5%	50 (8.8)
Total	92 (100.0%)	229 (100.0%)	150 (100.0%)	95 (100.00%)	566 (100.0%)

### 3.8 Infant Feeding Counseling:

Table 9 shows proportion of HIV sero positive women who were counseled on infant feeding during pregnancy, at delivery and after giving birth. According to this table, 49.6% of HIV + ve mothers were counseled on infant feeding options while pregnant. Those counseled during and after delivery were 21.8 and 28.6 percent respectively.

**Table 10:** Infant feeding counseling to Respondent mothers in PMTCT

Descriptor	HIV +		HIV -	
	n	%	n	%
Counseled on IFO				
• Yes	70	76.1	57	24.9
• No	22	23.9	127	55.5
• Do not remember	0	0.0	45	19.6
When counseled			Not asked	
• During pregnancy	59	49.6		
• During delivery	26	21.8		
• After delivery	34	28.6		
• Others	0			
Total	119	100	229	100.0

### Discussion:

Infant feeding counseling is very important for all mothers regardless of their HIV status. The findings show that about 24.0 percent of the HIV + ve mothers did not receive any infant feeding counseling. This is likely to cause mothers to feed their infants in any way, which greatly contributes to MTCT of HIV. WHO/UNICEF (1998) recommends

that all HIV + ve mothers should be counseled on infant feeding so that they make an informed choice on feeding their babies and should be supported in whatever method they choose. Counseling the mother during pregnancy is important so that she gets enough time to prepare herself for feeding the baby. Good infant feeding counseling is vital for a HIV+ve mother to select and practice the safest infant feeding method for herself and her baby. The findings from Botswana (2001) show that 66.0 percent of HIV +ve mothers discussed with health workers on infant feeding during pregnancy and only 35.0 percent discussed advantages and disadvantage of the options. In Zambia (UNICEF, 2002), it was revealed that in the PMTCT sites, counselors did not counsel mothers on advantage and disadvantage of various feeding options but rather discussed the mothers' circumstances and living conditions.

### 3.9 Infant Feeding Options Choice:

Infant feeding options which were mentioned and used by HIV+ ve mothers in PMTCT sites are given in Table 10. The table reveals that, early cessation of breastfeeding was mentioned by 35.0 percent of mothers. Other methods mentioned were exclusive breastfeeding for 6 months (15.3%), expressed and heat treated breast milk (0.8%), and animal milk (31.0%). Also a proportion of mothers (27.3%) mentioned commercial infant formula as one of the options available for HIV +ve mothers. About the use of the options mentioned, the data show that 55.7 percent of mothers used early cessation of breastfeeding. Other used infant feeding options were exclusive breast feeding for 6 months (17.1%), animal milk (10%), and commercial infant formula (14.3%). Other women (2.9%) were found to use other infant feeding options which are not given in the PMTCT guide.

**Table 10: Infant feeding options mentioned and used by respondent mothers in PMTCT**

IFO	Mentioned (n)	%	Used	%
EBF for 6 months	22	15.3	12	17.1
Early cessation of breastfeeding	50	35.0	39	55.7
Expressed and heat treated breast milk	1	0.8	0	
Wet nursing	0	0.0	0	0.0
Animal milk	31	21.6	7	10.0
Commercial infant formula	39	27.3	10	14.3
Evaporated milk	0	0.0	0	0.0
Others			2	2.9
Total responses	143	100.0	70	100.0

### Discussion:

Infant feeding options for the HIV positive mothers are divided into breast milk options and replacement feeding or breast milk substitutes. The UN agencies recommend that HIV positive mother should avoid breastfeeding as soon as the replacement feeding is AFASS. Exclusive breastfeeding is highly recommended. Shown in the results, 5.7 and 17.1 percent of all HIV positive mothers interviewed used exclusive breastfeeding for 3 and 6 months respectively. In Kwazulu Natal (2003) it was found that mothers attending PMTCT sites, 34.0 percent were exclusively breastfeeding their infants for 0-6 and mixed feeding were 40.7 percent.

### 3.10. Reasons for IFO choice:

Table 11 shows reasons given by mothers on choosing the infant feeding option. From this table, it can be seen that the advice from health service providers was the main reason (24.8%) for choosing infant feeding option. Other reasons were affordability (22.9%), availability (12.8%), and reduced risk of HIV transmission (11.0%). Cultural acceptability (9.2%) and advice of other persons (0.9%) were other reasons cited by mothers. Furthermore, 15.6 percent of respondents gave other reasons as personal experience and decision.

**Table 11: Reasons given by Respondent mothers on choosing the current IFO in PMTCT**

Reasons	HIV + mothers	%
Affordability	25	22.9
Advised by health workers	27	24.8
Availability	14	12.8
Acceptable to the community	10	9.2
Nutritional importance	3	2.8
Less risk of HIV transmission	12	11.0
Advised by other person	1	0.9
Others	17	15.6
Total response	109	100.0

### Discussion:

Understanding the reasons that lead to mothers to choose certain Infant Feeding Options is very critical for developing appropriate interventions. Health service providers have again come out as the most reason for mothers to choose options. This means that, this group needs adequate training to be able to understand and give appropriate advice to mothers considering the different risks associated with each option. Affordability also matters a lot in one's decision. Therefore, infant-feeding options should be adapted to local settings with consideration of affordability. There is a great need to identify locally appropriate infant feeding options, which are affordable and put some strategies for safer feeding practices but without jeopardizing breastfeeding. In South Africa (2003), some main reasons for choosing options were availability of time, money, and infant care support, access to safe and clean drinking water. The study in Botswana (2001) revealed that many mothers had made their decisions about infant feeding with help from health workers.

### 3.11. IFO Practices:

Table 12 shows infant feeding practices among HIV+ve mothers in PMTCT areas. The table shows that, 55.7 percent of mothers were given demonstration on infant feeding option, which they chose. However, 44.3 percent of mothers were not given demonstration. Furthermore, the percentage of women who did not change from one infant feeding option to another was 78.6, while those who changed were 21.4 percent.

About the support given to mothers during the time of changing from one infant feeding option to another, only 46.7 percent of HIV+ve mothers were supported whereas 53.3 percent were not given any support. Of those supported, 33.3 percent were given demonstration on the new infant feeding option during the change. The remaining 66.7% were not given demonstration on the new infant feeding option

during the change. Some reasons for changing from one option to another as cited by mothers were mother's personal decision (26.7%), too much baby crying (20.0%).

As regards to breastfeeding demonstration, most of the HIV +ve mothers (82.4%) demonstrated on positioning the baby at the breast inadequately. On the other hand, the majority of the HIV + ve mothers (86.3%) demonstrated attachment inadequately.

Furthermore, the data show that 47.1percent of HIV +ve mothers were feeding their infants on demand, 43.1 percent fed their infant less than 8 times within 24 hours.

**Table 12: Column % of Respondent mothers on IFO practices in PMTCT**

Descriptor	Respondents	%
Demonstrated on IFO chosen		
• Yes	39	55.7
• No	31	44.3
Changed from one IFO to another		
• Yes	15	21.4
• No	55	78.6
Given support when changed		
• Yes	7	46.7
• No	8	53.3
Demonstrated IFO when changed		
• Yes	5	33.3
• No	10	66.7
Reasons for changing		
• Poor health and weight gain	1	6.7
• Expensive	2	13.3
• Advice from health worker	3	20.0
• Too much baby crying	3	20.0
• Personal decision	4	26.7
• Others	2	13.3
Breastfeeding mothers demonstration on positioning		
• Adequate	9	17.6
• Inadequate	42	82.4
Breastfeeding mothers demonstration on attachment		
• Adequate	7	13.7
• Inadequate	44	86.3
Feeding frequency		
• On demand	24	47.1
• <8	22	43.1
• Do not know	5	9.8

### Discussion:

The findings with regard to IFO practices among HIV+ve mothers in PMTCT suggest that the support given to mothers is inadequate. Positioning and attachment demonstration among mothers was inadequate. This is dangerous as such inadequacies lead to breast engorgement, mastitis and sore nipples, which increase the risk of MTCT of HIV. The available literature shows that poor demonstration on IFO is as dangerous as mixed feeding when it comes to MTCT of HIV. It was revealed during focus group discussion and key informants interview that breast conditions are among the problems that face women who do not breastfeed. It is recommended that mothers allow infants to breastfeed on

demand day and night usually 8-12 times in 24 hours. This is important if the infant has to get enough breast milk and the mother to have constant supply of breast milk.

### 3.12 IFO Support and Decision Influence:

The results of support given to mothers with regard to infant feeding option and who influences them on their feeding decision are presented in Table 13. The table shows that, 43.4 percent of mothers are supported by health service providers on using effectively the option chosen. Family members and other people including friends and mates support the mothers by 19.3 and 20.5 percent respectively. It was also learnt from the focus group discussion that in-laws also have an influence on mothers feeding decision. The data in the table also show that the majority of mothers (67.1%) were not visited by health service providers to see how they are doing with IFO selected. Those happened to be visited, 69.7 percent of them were visited a month ago while the rest (39.1%) were last visited more than one month ago.

As can be seen from the same table, health service providers are the most influencers (95.7%) of mothers on choosing infant feeding option.

**Table 13: Respondent mothers on support given to practice the chosen IFO**

Descriptor	Respondents	%
People supporting the mother on chosen IFO		
• Family members	16	19.3
• Other relatives	11	13.2
• Health service providers	36	43.4
• Community based organizations	3	3.6
• Others	17	20.5
Total response	83	100.0
Visited by infant feeding counselor		
• Yes	23	32.9
• No	47	67.1
Total	70	100.0
Last visit		
• A month ago	16	69.7
• Two months ago	1	4.3
• Long time	5	21.7
• Do not remember	1	4.3
Total	23	100.0
Influence on choosing IFO		
• A friend	0	0.0
• Relatives	0	0.0
• Electronic Media	0	0.0
• IEC materials	0	0.0
• MCH	22	95.7
• Others	1	4.3
Total	23	100.0
Feelings of mothers on using the current IFO		
• Good	70	76.1
• Bad	22	23.9
Total	92	100.0

### 3.14 Replacement Feeds Preparation:

All mothers who were feeding their infants on replacement feeds were asked to demonstrate on some selected preparatory aspects. Their responses are presented in Table 14. From Table 14 the data show that, more animal milk is used in one meal preparation than commercial infant formula (230 vs 41 ml). The commercial infant formula uses more boiled water (139.3 vs 20 animal milk) and the amount of sugar is higher (11.4 g vs 2 animal milk).

**Table 14: Demonstration on replacement feeds preparation by Respondent Mothers in PMTCT**

Types of feed	Mean amount of milk per meal (ml)	Mean amount of water (ml)		Mean amount of sugar (g)	Mean number of meals per day	Total	
		Boiled	Un-boiled				
Animal feed	230	20	179	2	5	7	41.2
Commercial infant formula	41	139.3	27	11.4	5.3	10	58.8

### Discussion:

Mixing of animal milk, sugar and water in order to meet the nutritional needs of infants is very crucial. This study revealed that rationing these three items was a major problem among the HIV + ve mothers. In general the mixing is 100 mls of animal milk, 50 mls of water and 10 g of sugar ( i.e 1 part water,2 parts milk and 1/10 of undiluted milk sugar). The findings show that this ratio is not adhered to, women just mix the way they know. This also came out vividly during the focus group discussion and key informant interview where it was revealed that water from streams and wells is just added to reduce the strength of the milk and some mothers do not add sugar as they can not afford. In some communities instead of adding sugar, glucose is used. On one side, preparation of commercial infant formula should follow the instructions given on the container. This was observed not seriously considered during preparation of such meals. Such preparations could have some adverse effects on the nutrition and health status of these children. Some deliberate efforts are needed to provide such knowledge and skills to the women in this group.

### 3.15 Constraints and Recommendation in PMTCT sites:

All HIV+ mothers at the end of the interview were asked on constraints they faced, if any, and give recommendation on how to improve infant feeding for HIV+ mothers. From table 15, about 59.0 percent of mothers faced no problem during the course of feeding their infants. However, 14.1 percent of these mothers found that replacement feeds were too expensive to afford, while 12.0 percent faced stigmatization from family and community members.

The data further show that, about 38.0 percent of mothers didn't have what to recommend on how to improve infant feeding issues especially to the HIV+ mothers. A total of 15.8 percent of mothers recommended that HIV+ mothers should be given breast feeding education. There were also 14.7 percent of mothers who recommended on both avoiding mixed feeding and adhering to health service providers' advice on infant feeding and HIV.

**Table 15: Responses of mothers about constraints and recommendation on infant feeding in PMTCT**

Description	Respondents	%
Constraints		
• No constraint	54	58.7
• Stigma from family and community members	11 13	12.0 14.1
• Too expensive to afford	1	1.1
• Unreliable source of commercial formula	1	1.1
• Preparation difficulties	4	4.3
• Infants got infected and poor gain	5	5.4
• Breast problems	3	3.3
• Others		
<b>Total</b>	<b>92</b>	<b>100.0</b>
Recommendations		
- Breastfeeding education to mothers to avoid breast problems	5	5.3
- Not breastfeeding at all for HIV+ mothers	6	6.3
- Breastfeeding education to HIV+ mothers	15	15.8
- Avoid mixed feeding	1	1.1
- Infant commercial formula aid	14	14.7
- Breastfeeding for 3 or 6 months only	4	4.2
- Adhering to health services providers advice on infant feeding and HIV	14	14.7
- No recommendation	36	37.9
<b>Total responses</b>	<b>95</b>	<b>100.0</b>

#### Discussion:

Although replacement feeds have no risk of transmitting HIV from the mother to the child, they still seem to be too expensive to be afforded by many mothers. Again, the issue of stigma associated with not breastfeeding has come out of as one of the constraints that such mothers face. Recent studies in Zimbabwe (2000), and Zambia (2000) showed that the emergency of HIV has increased stigma to mothers who do not breastfeed, as this is a norm in African setting. This could be reduced through partner and community involvement in infant feeding issues as they have influence on mother's decision.

Mothers have recommended that breast feeding education and avoidance of mixed feeding are important if mother to child transmission of HIV is to be reduced. These recommendations match with those of UNAIDS, WHO and UNICEF (1997) which put forward that women should be provided with enough

information and those who choose to breastfeed including HIV positive mothers should be encouraged and supported. Avoidance of mixed feeding has been established to greatly contribute to less risk of transmission.

### **3.16: HEALTH SERVICE PROVIDERS**

#### **3.16.1 Breastfeeding knowledge:**

The data depicted in Table 17 show the knowledge of health service providers (HSP) on a few selected items both in PMTCT and non-PMTCT sites. It is clearly shown that 25.8 and 21.4 percent of HSP had a knowledge that breastfeeding gives good nutrition and protective advantage to the infant respectively. The psychological advantage of breastfeeding seemed to be known by only 4.5 percent of all HSP interviewed.

Initiation of breast-feeding within one hour after delivery was responded by 93.8 percent of HSP. On the other hand, 52.0 percent of HSP mentioned that colostrum has a nutritional importance to the infant. However, there were 2.3 percent of HSP who neither knew the importance of colostrum nor the recommended time for breastfeeding initiation.

The HSP were also asked to explain the meaning of EBF. The table shows that, 46.4 percent explained that it is feeding an infant on breast milk only for 6 months. Others, (26.5%) said that EBF is feeding the infant on breast milk only for 4-6 months. Among these HSP, 4.7 percent did not know the meaning of EBF.

With regard to importance of EBF, 31.3 percent of HSP showed that it provides good nutrition for the infant. Also, 29.2 percent mentioned that its importance is based on reducing risks of infections to the infants. The importance of EBF in reducing the risks of MTCT of HIV was only known by 5.2 percent of all HSP.

When HSP were asked whether or not pre-lacteal feeds affect breastfeeding, 86.3 percent said that they do. On mentioning effects, the data show that, 28.5, 26.7 and 21.7 percent of HSP mentioned that pre-lacteal feeds reduce appetite, increase the risks of infections and they damage infants' alimentary canal respectively.

**Table 17: Knowledge of Respondent HSP in PMTCT and non-PMTCT**

Descriptor	PMTCT		Non PMTCT		TOTAL	
	n	%	n	%	n	%
Advantage of breastfeeding						
• Nutritious	94	24.9	96	26.8	190	25.8
• Protective	79	20.9	79	22.1	158	21.4
• Family Planning	41	10.8	34	9.5	975	10.0
• Bonding	62	16.4	68	19.0	130	17.7
• Economical	52	13.8	43	12.0	95	12.9
• Psychological	20	5.3	13	3.6	33	4.5
• Others	30	7.9	25	7.0	55	7.5
Total response	378	100.0	358	100.0	736	100.0
Initiation of breastfeeding						
• Within 1 hour	97	94.2	101	93.5	198	93.8
• 2-6 hours	2	1.9	2	1.9	4	1.9
• After 6 hours	3	2.9	2	1.9	5	2.4
• Do not know	1	1.0	3	2.8	4	1.9
Total	103	100	108	100	211	100.0
Importance of colostrums						
• Nutritious	75	49.0	81	55.1	156	52.0
• Protection	63	41.2	49	33.3	112	37.4
• Others	13	8.5	12	8.2	25	8.3
• Do not know	2	1.3	5	3.4	7	2.3
Total response	153	100.0	147	100.0	300	100.0
EBF meaning						
• Breast milk only for 6 months	65	33.1	33	30.6	98	46.4
• Breast milk only below 4 months	18	17.5	38	35.2	56	26.5
• Others	5	4.9	13	12.0	18	8.5
• Do not know	2	1.9	8	7.4	10	4.7
• Breast milk available all the time	0	0.0	4	3.7	4	1.9
• Breast milk is natural	1	1.0	2	1.9	3	1.4
• Breast milk only without mixing	0	0.0	1	0.9	1	0.5
• Breast milk only without mixing	12	11.7	9	8.3	21	10.0
Total	103	100.0	108	100.0	211	100.0
Importance of EBF						
• Nutritious	68	27.4	77	35.8	145	31.3
• Family Planning	34	13.7	25	11.6	59	12.7
• Reduce risks of MTCT of HIV	23	9.3	1	0.5	24	5.2
• Reduced costs	25	10.1	18	8.4	43	9.3
• Reduced risks of infections	65	26.2	70	32.5	135	29.2
• Others	33	13.3	24	11.2	57	12.3
Total response	248	100.0	215	100.0	463	100.0
Prelacteal feeds affecting B/F						
• Yes	94	91.3	88	81.5	182	86.3
• No	9	8.7	20	18.5	29	13.7
Total	103	100.0	108	100.0	211	100.0
Effects of prelacteal feeds on b/f						
• Reduced appetite	48	26.1	48	31.4	96	28.5
• Increased risks of infections	49	26.6	41	26.8	90	26.7
• Damage alimentary canal	39	21.2	34	22.2	73	21.7
• Delayed initiation	26	14.4	19	12.4	45	13.3
• Others.	22	12.0	11	7.2	33	9.8
Total response	184	100.0	153	100.0	337	100.0

## **Discussion:**

From the community point of view, HSP are seen as helpful people in all matters pertaining to health. Likewise, when it comes to issues of HIV/AIDS, the HSP are expected to be knowledgeable enough to provide correct information. It was surprising to find out that out there, some HSP are not aware on what is EBF and its importance on reducing the risks of MTCT of HIV. It is established that mixed feeding which includes provision of pre-lacteal feeds increases the risks of MTCT. This was however, found to be little known among the HSP. Inadequate knowledge on the recommended breastfeeding initiation time among HSP might contribute to provision of plain water and replacement feeds among the mothers. There is a need to have a strategy for capacity building of HSP especially now where MTCT of HIV transmission is on the increase.

### **3.16.2 Breastfeeding Practices:**

The data reported in Table 18 give an indication on the knowledge of HSP regarding breast feeding practices. The data show that more than half (57.0%) of HSP know that breast feeding on demand enables infants to get enough milk. Only 3.7 percent of HSP responded that breast feeding on demand helps to prevent breast problems.

On the breast feeding duration, most (93.8%) of HSP interviewed mentioned that the recommended duration is more than 1½ years. This is more or less to the universally recommended 2 years and beyond.

The HSP were also asked to demonstrate positioning and attachment of infants during breastfeeding. It was found that 34.0 and 23.7 percent were able to demonstrate on how infant head and buttocks should be supported when breastfeeding. About attachment, 41.0 percent demonstrated well on how large areola should be in the mouth. The table shows further that, there were 3.7 and 13.0 percent of HSP who did not know how the infant should be positioned and attached to the breast during feeding respectively.

All HSP were requested to mention type of service they provide to mothers that support breastfeeding. The data show that, while about 38.0 percent provide breast-feeding education, 28.9 percent provide health education to such mothers. Among these HSP, only 7.8 percent provide infant feeding counseling to the mothers.

**Table 18: Knowledge of Respondent H/W in PMTCT and Non-PMTCT**

Descriptor	PMTCT		Non PMTCT		TOTAL	%
	n	%	n	%		
Importance of b/f demand						
• Infant gets enough milk	80	53.7	88	60.3	168	57.0
• Helps production of breast milk	35	23.5	28	19.2	63	21.3
• Prevents breast problems	6	4.0	5	3.4	11	3.7
• Others	28	18.8	25	17.1	53	18.0
Total response	149	100.0	146	100.0	295	100.0
B/F duration						
• Less than 1 year	0	0.0	0	0.0	0	0.0
• 1 year	2	1.9	0	0.0	2	0.9
• 1½ years	6	5.8	2	1.9	8	3.8
• More than 1½ years	92	2.9	106	98.1	198	93.8
• Do not know			0	0.0	3	1.4
Total response	103	100.0	108	100.0	211	100.0
Good positioning						
• Head supported	81	32.7	74	35.6	155	34.0
• Buttocks supported	60	24.2	48	23.1	108	23.7
• Infant turning to the mother	36	14.5	31	14.9	67	14.7
• Neck not bending	18	7.3	9	4.3	27	6.0
• Mother not bending	41	16.5	18	8.7	59	12.9
• Others	9	3.6	14	6.7	23	5.0
• Do not know	3	1.2	14	6.7	17	3.7
Total response	248	100.0	208	100.0	456	100
Good attachment						
• Mouth wide opened	34	20.2	9	7.4	43	15.0
• Lips turning out ward	22	13.1	2	1.6	24	8.3
• Large part of areola in the mouth	67	40.0	52	42.6	119	41.0
• Chicks round	2	1.2	1	0.8	3	1.0
• Others	32	19.0	31	25.4	63	21.7
• Do not know	11	6.5	27	22.1	38	13.0
Total response	168	100.0	122	100.0	290	100.0
Services provided supporting b/f						
• Health education	42	35.3	32	23.3	74	28.9
• Breastfeeding education	48	40.3	49	35.8	97	37.9
• Infant feeding counseling	6	5.0	14	10.2	20	7.8
• Support mothers to initiate breastfeeding	0	0.0	22	16.1	22	8.6
• Others	9	7.6	8	5.8	17	6.6
• No direct support	14	11.8	12	8.8	26	10.2
Total	119		137		256	100.0

**Discussion:**

Breastfeeding on demand is very important in ensuring constant breast milk productions, infant getting enough milk and preventing some breast conditions. It has been revealed in the study that only 21.3 percent of HSP know that breastfeeding on demand helps in production of breast milk. On top of that, it was found that there some HSP with little knowledge on positioning and attachment. This implies that such services which are very important in this era of MTCT of HIV are limited. The limitation was again found to be obvious as shown by a small percentage of HSP providing support to breastfeeding particularly on initiation (8.6%) and infant feeding counseling (7.8%). This situation calls again for a need to equip well HSP with knowledge and skills on infant feeding if more support is to be extended to mothers.

### **3.16.3 Complementation:**

Table 19 shows knowledge of respondent health workers on complementation in both PMTCT and non-PMTCT sites. It is clearly shown that 41.7 and 36.5 percent of HSP knew that the complementation age is 4-6 months and at 6 months respectively. While 11.9 percent of HSP mentioned that the age of complementation is below 4 months, 0.9 percent was unaware of the appropriate age of complementation.

As regards to food groups for complementary foods, 28.9 percent of HSP mentioned cereals, roots and cooked banana. Other food groups mentioned were legumes and animal origin (25.7%) and fat, honey and nuts (18.6%). The food group of vegetables was mentioned by only 10.0 percent of all HSP interviewed.

The data further show that 51.2 and 42.2 percent of HSP advice mothers to use spoon and cup during feeding respectively. Bottle feeding is still being advised to mothers by 0.8% percent of HSP.

All HSP mentioned to advice mothers on the use cup were asked about the advantage of cup feeding. The only advantage (83.9%) mentioned was the easy to clean one. However, avoiding nipple confusion as an advantage of cup feeding was not mentioned by any HSP in both PMTCT and non-PMTCT sites.

When HSP were asked about appropriate feeding frequency for infants aged 6-9 months, 28.0 percent cited 1-2 meals as the appropriate feeding frequency at this age. Also, 26.1 percent said that 5 or more meals were appropriate. It was further found that 8.5 percent of HSP did not know how many times an infant should be fed at this age.

Data on appropriate feeding frequency for infants aged 10-12 months show that 5 or more is the most appropriate (46.0%), followed by 3 and 4 times (21.8 %). However, 7.6 percent of HSP did not know the appropriate feeding frequency of infants aged 10-12 months.

Considering things to take into account when preparing or feeding an infant, one of this is utensil cleanliness which was mentioned by 31.7 percent of all HSP. Body hygiene was mentioned by 26.3 percent and 19.1 percent said safety and hygiene of the food. The issue of water safety and hygiene was mentioned by 8.3 percent of HSP.

**Table 19: Knowledge of Respondent HSP on complementation in PMTCT and Non-PMTCT**

Descriptor	PMTCT		Non PMTCT		Total	
	n	%	n	%	n	%
Age of complementation						
• < 4 months	12	11.7	13	12.0	25	11.9
• 4-6 months	30	29.0	58	53.7	88	41.7
• At 6 months	46	44.7	31	28.7	77	36.5
• > 6 months	15	14.6	3	2.8	18	8.5
• Others	0	0	2	1.9	2	0.9
• Do not know	0	0	1	0.9	1	0.5
<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>211</b>	<b>100.0</b>
Food groups for complementary foods						
• Cereals, roots and cooked bananas	99	28.7	103	29.0	202	28.9
• Legumes and animal origin	90	26.0	90	25.4	180	25.7
• Vegetables	31	9.0	39	11.0	70	10.0
• Fruits	51	14.8	59	16.6	110	15.7
• Fat, honey and nuts	70	20.3	60	16.9	130	18.6
• Others	4	1.2	4	1.1	8	1.1
<b>Total response</b>	<b>345</b>	<b>100.0</b>	<b>355</b>	<b>100.0</b>	<b>700</b>	<b>100.0</b>
Feeding method they advice mothers						
• Cup	90	46.6	64	37.2	154	42.2
• Spoon	90	46.6	97	56.4	187	51.2
• Bottle	0	0.0	3	1.7	3	0.8
• Others	13	6.8	8	4.7	21	5.8
<b>Total response</b>	<b>193</b>	<b>100.0</b>	<b>172</b>	<b>100.0</b>	<b>365</b>	<b>100.0</b>
Advantage of cup feeding						
• None	2	2.0	0	0.0	2	1.2
• Easy to clean	86	84.3	55	83.3	141	83.9
• Avoid nipple confusion	0	0.0	0	0.0	0	0.0
• Others	14	13.7	11	16.7	25	14.9
<b>Total response</b>	<b>102</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>168</b>	<b>100.0</b>
Feeding frequency at 6-9 months						
• 1-2	17	16.5	14	13.0	31	14.7
• 3	33	32.0	26	24.1	59	28.0
• 4	17	16.5	31	28.7	48	22.7
• 5 or more	27	26.2	28	25.9	55	26.1
• Do not know	9	8.8	9	8.3	18	8.5
<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>211</b>	<b>100.0</b>
Feeding frequency at 10-12 months						
• 1-2	4	3.9	2	1.9	6	2.8
• 3	19	18.4	27	25.0	46	21.8
• 4	20	19.4	26	24.1	46	21.8
• 5 or more	53	51.5	44	40.7	97	46.0
• Do not know	7	6.8	9	8.3	16	7.6
<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>211</b>	<b>100</b>
Things to consider when preparing or feeding infant						
• Body hygiene	82	27.7	73	24.9	155	26.3
• Safety and hygiene of food	48	16.2	65	22.2	113	19.1
• Safety and hygiene of water	29	9.8	20	6.8	49	8.3
• Utensils cleanliness	89	30.1	98	33.4	187	31.7
• Eating place cleanliness	35	11.8	29	9.9	64	11
• Others	13	4.4	8	2.8	21	3.6
<b>Total response</b>	<b>296</b>	<b>100.0</b>	<b>293</b>	<b>100.0</b>	<b>589</b>	<b>100.0</b>

#### **3.16.4 MTCT OF HIV:**

The results on MTCT of HIV from PMTCT HSP are presented in Table 20. The data show that, 37.7 and 37.5 percent of HSP respectively were aware that MTCT of HIV can occur during delivery and breastfeeding. About 23.0 percent of HSP mentioned that MTCT of HIV can occur during pregnancy.

Regarding the rate of transmission, the majority (89.1%) said that not all HIV+ve pregnant and lactating mothers can transmit the virus to their infants.

The HSP responded that factors increasing the risk of MTCT of HIV through breastfeeding as shown in table 20 are breast condition (32.9%), and mixed feeding (15.4%). Other factors such as mothers' sweat and saliva on the breast were mentioned by 22.8 percent of HSP. Only 4.0 percent mentioned that poor positioning and attachment was one of the factors increasing such a risk.

The data also show that HSP were aware that among the advised measures to reduce the risk of MTCT of HIV through breastfeeding are infant feeding options (33.9%), appropriate breastfeeding technique (17.0%) and avoid mixed feeding (16.8%). However, 24.4 percent mentioned other factors such as taking not breastfeeding an infant from feeding on the breast which has mother's saliva and sweat.

**Table 20: Knowledge of Respondent HSP on MTCT of HIV in PMTCT and Non-PMTCT**

Descriptor	PMTCT		Non PMTCT		Total	
	n	%	n	%	n	%
Ways of MTCT of HIV						
• During pregnancy	76	27.8	43	18.2	119	23.4
• During delivery	97	35.5	95	40.3	192	37.7
• During breastfeeding	95	34.9	96	40.7	191	37.5
• Others	5	1.8	2	0.8	7	1.4
Total	273	100.0	236	100.0	509	100.0
Can all HIV + ve pregnant / lactating women transmit HIV to infants						
• Yes	9	8.7	14	13.0	23	10.9
• No	94	91.3	94	87.0	185	89.1
Total	103	100.0	108	100.0	211	100.0
Factors increasing the risk of MTCT of HIV through B/feeding						
• None	0	0.0	8	5.3	8	2.3
• Breast condition	68	34.2	47	31.1	115	32.9
• Viral load	15	7.5	9	6.0	24	6.9
• New infection	17	8.5	2	1.3	19	5.4
• Poor positioning and attachment	12	6.1	2	1.3	14	4.0
• Mixed feeding	37	18.6	17	11.3	54	15.4
• Duration of b/feeding	13	6.5	23	15.2	36	10.3
• Others	37	18.6	43	28.5	80	22.8
Total	199	100.0	151	100.0	350	100.0
Advised measures to reduce MTCT through b/feeding						
• None	0	0.0	8	6.1	8	2.5
• Infant feeding options	57	30.6	50	38.5	107	33.9
• Appropriate techniques of b/feeding	40	21.5	14	10.8	54	17.0
• Avoid re-infection	15	8.1	2	1.5	17	5.4
• Avoid mixed feeding	39	21.0	14	10.8	53	16.8
• Others	35	18.8	42	32.3	77	24.4
Total	186	100.0	130	100.0	316	100.0

**Discussion:**

Both HSP in PMTCT and Non-PMTCT were aware that during delivery HIV can be transmitted (35.5 versus 40.3%) and breastfeeding can also contribute (34.9 versus 40.7%). A Meta analysis has estimated that breast-feeding may increase the rate of transmission by 14.0 percent. The WHO estimate that the transmission of HIV during pregnancy is 5-10%, labour and delivery is 10-20% and breastfeeding for 2 years is 10-20%. In PMTCT, it was found that 8.7 percent of HSP knew that all HIV +ve pregnant lactating mothers can transmit the HIV to their children. This was slightly higher (13.0%) in non-PMTCT. There was a difference on knowledge of factors increasing the

risk of transmission during breastfeeding. In PMTCT, 8.5 percent mentioned new infection as of the factors while only 1.3 percent said so in non-PMTCT. This was also true for poor positioning and attachment (6.1% in PMTCT and 1.3% in non PMTCT) and duration of breastfeeding (6.5% in PMTCT and 15.2% in non PMTCT). It was striking to find that infant feeding options as a major way to reduce MTCT of HIV was known to many non-PMTCT than PMTCT HSP (38.5 versus 30.6%). HSP in PMTCT were as twice as much aware that appropriate techniques of breastfeeding and avoiding mixed feeding were among the measures of reducing MTCT during breastfeeding (21.5, 21.0 versus 10.8 and 10.8%).

The findings generally show that many HSP in both PMTCT and non-PMTCT sites have a limited knowledge on various issues pertaining to MTCT of HIV. The study that was conducted in Botswana (2001) found that the knowledge of MTCT of HIV was generally poor, both among trained and untrained staff at non-PMTCT and PMTCT sites. There is a need to empower such HSP with knowledge on MTCT of HIV if mothers were to benefit more and reduction of MTCT has to be realized.

### **3.16.5 Infant Feeding Options:**

The Table 21 below shows the knowledge of respondent HSP in PMTCT sites on infant feeding options. About 44.0 percent of HSP in PMTCT sites were trained on HIV and Infant Feeding Counseling. Among the HSP trained, 24.5 percent attended a less than one week course, whereas 24.5 percent attended one week training. Moreover, 28.3 and 42.4 percent attended a training course for two to three weeks and four to six weeks respectively. The table reveals that 5.1 percent attended a course which took more than 6 weeks.

According to Table 21, 36.4 percent of HSP attended training on HIV and Infant Feeding options. Some 24.5 percent of HSP were taken through infant feeding counseling. Practical on preparation of replacement feeds was done by 28.2 percent and practices in hospital wards were conducted by 2.7 percent.

Infant feeding counseling skills, listening and learning skills were exposed to 41.4 percent of the HSP and 32.9 percent were exposed to building confidence and providing support skills.

The trained HSP were further asked to mention the IFOs that they knew. Some of the infant feeding options mentioned included, exclusive breastfeeding for 6 months (21.3%) and early cessation of breastfeeding (24.3%). Home-prepared infant formula by using animal milk was mentioned by 20.7percent and 15.0 percent mentioned commercial infant formula. Other options such as expressed and heat-treated breast milk and wet nursing were mentioned by 9.5 percent and 5.9 percent respectively while 0.6 percent of HSP mentioned evaporated milk.

**Table 21: Knowledge of Respondent H/W on IFO in PMTCT**

Descriptor	Respondent Health Service Providers	
	n	%
Training on HIV and IFC		
• Yes	45	43.7
• No	43	41.7
• Not sure	15	14.6
Total	103	100
How long		
• Below one week	12	12.1
• One week	12	12.1
• Two to three weeks	28	28.3
• For to six weeks	42	42.4
• More than 6 weeks	5	5.1
Total response		100.0
Topics related to IFC		
• IFC skills	27	24.5
• IFO	40	36.4
• Practical on preparation of replacement feeds	31	28.2
• Practical in wards	3	2.7
• Others	9	8.2
Total response	110	100.0
Important IFC skills mentioned		
• None	3	4.3
• Listening and learning	29	41.4
• Building confidence and provide support	23	32.9
• Others	15	21.4
Total response	70	100.0
IFO mentioned		
• None	1	0.6
• EBF for 6 months	36	21.3
• Early cessation of b/f	41	24.3
• Expressed and heat treated breast milk	16	9.5
• Wet nursing	10	5.6
• Animal milk	35	5.6
• Commercial infant formula	27	15.9
• Evaporated milk	1	0.6
• Others	2	1.2
Total response	169	100

**Discussion:**

Infant feeding options have been in place to help HIV+ve mothers continue feeding their infants in a less risky way of transmitting HIV to their babies. So as to create more awareness about this type of feeding, a number of HSP especially in PMTCT sites have been trained. It was surprising to find that there is a discrepancy in terms of the topics and duration of training. Some HSP went for a week, two weeks, six weeks and others even more than that. In a normal situation using the WHO/UNICEF training modules, the training on HIV and infant feeding counseling takes two weeks including five practical sessions. Further observation showed that the training sessions were conducted by different partners. It seemed from the HSP that VCT training was also considered as HIV

and infant feeding counseling. Some HSP with training on VCT were also found giving infant feeding counseling. Asia and Nyagawa (2004) found that there are a few trained counselors on breastfeeding, and HIV and infant feeding. Also they pointed that infant feeding counseling services are not extended to cover all regions and such very important services are inadequate district and community levels. There is a need to harmonize this kind of training so that all responsible HSP in PMTCT sites have the same level of training and knowledge with regard to infant feeding.

#### **3.16.6 IFO Practices:**

Table 22 presents the preference of the infant feeding options and their reasons as reported by mothers to the HSP. The data show that the most (68.9%) preferred option is early cessation of breastfeeding. The reasons for the preference were given as being less expensive (27.5%), it helps to avoid stigma (23.5%) and is easily doable (21.6%). The HSP also reported that the least preferred option is commercial infant formula (33.3%) followed by expressed and heat treated breast milk (31.1%). The most important reasons given for the least preference were that they are expensive (40.0%) and associated with stigma (33.3%). The table also shows that there were 1.9 and 4.4 percent of HSP who did not know what the reasons for mothers' preference were.

**Table 22: Reasons for the most and least preferred IFO given by respondent HSP**

Descriptor	PMTCT		Reasons	Total	
	n	%		n	%
Preference of IFO					
• EBF for 6 months	9	20.0	• Nutrition	1	1.9
• Early cessation of breastfeeding	31	68.9	• Less expensive	14	27.5
• Expressed and heat treated breast milk	0	0.0	• Avoid stigma	12	23.5
• Wet nursing	0	0.0	• Free supply of input formula	2	3.9
• Animal milk	1	2.2	• Reduced risk of MTCT	3	6.0
• Commercial infant formula	3	6.7	• Easily doable	11	21.6
• Evaporated milk	1	2.2	• Others	7	13.7
			• Do not know	1	1.9
Total response	45	100.0		51	100.0
Least preferred IFO					
• EBF for 6 months	2	4.4			
• Early cessation of breastfeeding	0	0.0			
• Expressed and heat treated breast milk	14	31.1			
• Wet nursing	2	4.4			
• Animal milk	6	13.3	• Expensive	18	40.0
• Commercial infant formula	15	33.3	• Stigma	15	33.3
• Evaporated milk	6	13.3	• Others	10	22.2
			• Do not know	2	4.4
Total response	44	100.0		44	100.0

### 3.16.7 Constraints and Recommendations:

All HSP in PMTCT sites were requested to mention the constraints reported by mothers and their own constraints in implementing the IFO, if any, and give recommendation on improving infant feeding in PMTCT programme. The HSP responses are reported in Table 8. The data show that 51.1 percent of mothers had reported to the HSP that the main constraint facing them was stigma. Also 20.0 percent of mothers faced a problem of revealing their status among family members. On the other hand, 22.2, 20.0 and 20.0 percent of HSP faced the problems of mothers changing options on their own, associated with stigma and lack of support from partners respectively.

The findings show that in order to improve infant feeding, 29.4 percent of HSP recommended infant feeding training among HSP and 25.5 percent recommended on strengthening the follow up system of mothers on IFO implementation. While 13.7 percent recommended on provision of infant feeding education to the mothers, 17.6 percent sided on provision of commercial infant formula aid to the mothers. A total of 11.8 percent did not have any recommendation.

**Table 23: Column % of constraints and recommendations of Respondent H/W in PMTCT**

Descriptor	Respondent H/W	%
Constraints faced by mothers on IFO implementation given to H/W		
• Avoid to be known among family members	9	20.0
• Stigma	23	51.1
• Expensive	5	11.1
• Compliance problems	3	6.7
• Others	4	8.9
• Do not know	1	2.2
Total response	45	100.0
Constraints faced by H/W on IFO implementation		
• Mothers changing options on their own	10	2.2
• Mothers shifting to another place	5	22.2
• Mothers changing clinic		
• Stigma	6	11.1
• Lack of support from partners	9	13.3
• Low of knowledge on infant feeding among mothers	9	20.0
• Infections among infants	1	20.0
• None		
	1	2.2
	4	8.9
Total response	45	100.0
Recommendation on improving IFO in PMTCT		
• Infant feeding training	15	29.4
• Commercial infant among health service providers	9	17.6
• Infant feeding education to mothers	7	13.7
• Strengthening follow up on IFO implementation	13	25.5
• Others		
• Do not have	1	2.0
	6	11.8
Total response	51	100.0

**Discussion:**

The findings obtained in this section correspond well with those from the focus group discussion. In the various discussions it was stated that normally in the communities HIV+ve mothers are given a negative attitude especially the ones that breastfeed. The communities feel in doing so, mothers transmit the HIV to their infants. This also goes with a minimal domestic care assistance given particularly from in-laws.

On top of that some communities were suggesting that these women should be given infant feeding education so that they know how to feed their infants. Also they suggested that such mothers should stop getting pregnant; and the government should look for alternative ways of feeding the mothers and their infants. Sensitization about HIV/AIDS in the communities was pointed out not to be number one and the best way of minimizing stigma.

#### **4. CONCLUSION**

The study has identified a number of infant feeding practices that are going on among mothers who are HIV+ve, -ve and HIV unknown status. Mixed feeding is being practiced by all groups of mothers regardless of their HIV status. Exclusive Breastfeeding is rarely done and those who claim to do it, is not done appropriately. Mothers still have limited knowledge on breast-feeding as well complementary feeding. Some mothers neither mention advantage of breastfeeding nor appropriate age for complementation. Also, the issue of foods that are suitable during complementary feeding is still a problem to many mothers.

With regard to infant feeding options, the HIV +ve mothers are in dilemma, as many of them cannot do it successfully. Some infant feeding options are not suitable and hence not used by the mothers. There is still limited knowledge on preparation of various infant-feeding options. Stigma among community members hinders the full use of the options as breastfeeding is a norm. Lack of support from family and community members increases difficulties to HIV+ve mothers in using the infant feeding options. Both health services providers and family members have an influence on mothers' decision on infant feeding issues.

Most of the health service providers have good knowledge on breastfeeding. However the majorities have low knowledge on complementation and infant feeding options in particular. Although they provide support to HIV+ve mothers and other groups of mothers on infant feeding but they had limitations in terms of demonstration particularly on breastfeeding techniques and preparations of replacement feeding. As such they find themselves limited in terms of support they extend to the mothers.

On the other hand, community members have little knowledge on breastfeeding, complementation and infant feeding options. Infant feeding options are not well known to them and as such they still encourage mothers to breastfeed. This is the same to the key informants including village government leaders and influential persons that were involved in the study.

#### **5. RECOMMENDATIONS**

The recommendations made on this study are based on researchers views and some are as given by the respondents themselves.

1. In the study, it has been observed that there is little knowledge and skills on breastfeeding, complementation and infant feeding options among mothers and health service providers. It is recommended that TFNC and UNICEF should intensify the training of Health Care Workers on lactation management, complementation and infant feeding in relation to HIV/AIDS.
2. In order for the mothers to have knowledge on breastfeeding particularly infant feeding options for the HIV+ve mothers, infant feeding counseling

- services should be made available in all health facilities. This could go hand in hand with intensification of IEC materials meant for the community and mothers in particular. TFNC should make sure that such materials are produced and available in all health facilities for distribution to the mothers.
3. As a continuous process, sensitization and awareness on HIV/AIDS among community members and the public at large should be strengthened. In so doing, stigma and lack of support on infant feeding to the mothers can be minimized.
  4. The Health service providers especially those supporting HIV+ve mothers on infant feeding options need to be strengthened in terms of knowledge and skills. This is because; the mothers are surrounded by a lot of factors that influence their decision on infant feeding.
  5. There is a great need to conduct more research on infant feeding options that are suitable in our setting. The existing options seem to be difficult too many mothers to implement. Another research area could be on looking at the risk of transmission of HIV from mother to child through various feeding ways that are going on among the HIV+ve mothers. For example, what is the risk of transmission for the HIV+ve mother to the child who is being mixed fed.

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