

**UPTAKE OF EARLY INFANT DIAGNOSIS OF HIV SERVICES AND IT'S
ASSOCIATED FACTORS AT WAKISO HCIV, WAKISO DISTRICT**

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DECLARATION

To the best of my knowledge, I declare that this research work is original and has never been presented anywhere either partially or in total for any academic award unless otherwise stated. I therefore present it for the award of the Degree of Bachelor of Nursing Science of International Health Sciences University.

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SIGNATURE

DATE

APPROVAL

This research was carried out under my supervision and it is therefore approved for submission the school of nursing (IHSU).

MR. AFAYO ROBERT

SIGNATURE

DATE

DEDICATION

This book is dedicated to my beloved husband Dr. Moses Walakira. My children: Davin Ddumba Walakira, Karen Nankabirwa Walakira and Jotham Makumbi Walakira. Thanks for the support towards accomplishing this assignment and the entire course. May the Almighty God reward you abundantly!

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May the almighty God bless you all!

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OPERATIONAL DEFINITIONS

An HIV exposed infant: A child less than 18 months of age born to a known HIV positive mother.

DNA PCR infant HIV testing: A direct method of testing for HIV using DNA PCR testing method performed on DBS collected from infants as early as six weeks before the age of eighteen months.

Uptake of DNA PCR HIV testing services: In this study, it means bringing an HIV exposed infant for HIV testing using DNA PCR on time (Between 6-8 weeks for first DNA PCR).

Early infant diagnosis of HIV infection: It is virological testing that detects HIV DNA or RNA used to diagnose HIV infection in infants and children below 18 months of age.

ACRONYMS AND ABBREVIATIONS

| | |
|---------|--|
| AIDS | Acquired Immunodeficiency Syndrome |
| ANC | Antenatal care |
| ART | Antiretroviral Therapy |
| DBS | Dried Blood Spots |
| DHT | District Health Team |
| DNA PCR | Deoxy Ribonucleic acid polymerase chain reaction |
| EID | Early Infant Diagnosis of HIV |
| EMTCT | Elimination of Mother To Child Transmission of HIV |
| HC | Health Center |
| HIV | Human Immunodeficiency Virus |
| HSD | Health Sub-District |
| MCH | Maternal Child Health |
| MOH | Ministry of Health |
| MTCT | Mother to Child Transmission of HIV |
| PCR | Polymerase Chain Reaction |
| PMTCT | Prevention of Mother to Child transmission of HIV |
| PNC | Postnatal Care |
| UAIS | Uganda AIDS Indicator Survey |
| UDHS | Uganda Demographic and Health survey |
| UNAIDS | Joint United Nations program on HIV/AIDS |
| UNICEF | United Nations Children's Fund |
| WHO | World Health Organization |

ABSTRACT

Introduction

Early Infant Diagnosis (EID) of HIV infection in HIV-exposed infants as early as six weeks using DNA-PCR technology is critical to improve pediatric HIV/AIDS care, and reduce child morbidity and mortality. In Wakiso district, EID service provision started in 2008 but its coverage in terms of proportion of HIV exposed infants reached is not clearly known.

General objective of the study

To determine the magnitude and the factors affecting uptake of early infant diagnosis services at Wakiso HCIV, Wakiso districts.

Methodology

This was a cross-sectional study carried out at Wakiso HCIV, Wakiso district. This study determined the prevalence of HIV among studied exposed infants and young children but also determined factors which were associated with utilization of EID for HIV infection.

Data was collected using a semi-structured questionnaire from the caregivers/mothers.

Results: Results were generated from 201 participants, 62% HIV exposed infants had been tested for HIV within the MOH recommended period of testing within two months of age.

In this study; Age of caregivers ($p=0.006$), type of caregiver ($p=0.003$), educational status of caregivers ($p=0.003$), occupation of caregiver ($p=0.002$), family size ($p=0.001$) and number of

children the caregiver had ($p=0.002$) were significantly associated with uptake of EID services on bivariate analysis.

On bivariate analysis, these factors were associated with early uptake of EID services. They are: Caregivers' knowledge of age for EID ($p<0.001$), knowledge of frequency of EID ($p<0.001$) awareness of HIV testing in infants during pregnancy ($p=0.002$), knowledge of benefits of EID ($p=0.003$), knowledge that EID can detect HIV ($p=0.018$), knowledge of appropriate of age of EID ($p<0.001$); and ART status of the caregiver ($p<0.05$)

The health facility factors on bivariate analysis associated with uptake of early infant diagnosis of HIV are: Waiting time ($p<0.039$); availability of EID services ($p<0.014$).

Conclusions

Uptake of EID services at Wakiso HCIV is 62% which is lower than the recommended MOH target of 80%.

Recommendations

The District Health Team and health workers at Wakiso HCIV should create awareness among communities on the availability and benefits of early infant testing services; strengthening option B + implementation in MCH to ensure enhanced access to ART among HIV positive pregnant women; strengthen health education during antenatal care visits to ensure that topics related to HIV testing in infants are well-articulated; strengthen family planning service provision; and advocate for improved education of the girl child in order to increase access to information

CHAPTER ONE: INTRODUCTION

Background

Early infant diagnosis of HIV infection is virological testing that detects HIV DNA or RNA used to diagnose HIV infection in infants and children below 18 months of age. Early virological diagnosis of infants facilitates early identification of infants with HIV-infection, a critical step in ensuring their access to HIV care and treatment; and enables the identification of those who are HIV-exposed that are still HIV negative, allowing their continued access and utilization of HIV exposed infants care services aimed at ensuring that they remain uninfected. It is a key component of child survival (WHO and UNICEF 2008).

HIV infection is still a worldwide burden with over 35.3 million people living with HIV in 2012 and more than half of them were women (UNAIDS 2013). Over 90% of the HIV Infection in infants and children results from Mother To Child Transmission of HIV (MTCT). HIV infections in infants and young children occur during pregnancy; labor and delivery; and postnatal period through breast feeding. The UNAIDS report on global AIDS epidemic 2013 highlighted that there were still 2.3 million new HIV infections globally in 2012 and 260,000 of whom were infants. In 2012, there were 3.3 million children living with HIV and 220,000 deaths (UNAIDS 2013).

HIV/AIDS disease burden is not uniformly distributed across the world with 25 million people infected with HIV (71% of the global burden) living in sub-Saharan Africa despite harboring

only 12% of the world's population. Of the 2.3 million new infections world, over 1.6 million occur in sub-Saharan Africa (UNAIDS 2013).

In 2012, it is estimated that there were 120,000 new infections in Uganda and 1.5 million people were living with HIV/AIDS (UAIS 2011). The Uganda AIDS Indicator Survey (UAIS) conducted in 2011 further revealed that HIV prevalence was 7.3% among 15-49 adults, with women in the reproductive age group having a higher prevalence of 8.3% as opposed to 6.1% among the men.

Early infant diagnosis (EID) of HIV infection creates the opportunity for identifying, testing and providing care for HIV-exposed infants. This potentially confers benefit to both HIV-infected, uninfected infants and their families through proper counseling, linkages to comprehensive HIV care, safe infant feeding options and follow up for growth monitoring and development.

HIV-related childhood mortality is still high in Sub-Saharan Africa despite availability of antiretroviral therapy (Cook et al, 2011). Due to rapid HIV disease progression in HIV-infected infants and young children, there is increased risk of death (Nuwagaba et al, 2010).

It is estimated that up to 30% of untreated HIV-infected children die before 12 months and over 50% die before the age of 2 years), implying the urgent need for identifying and enrolling them into care and treatment programs (Cook et al, 2011).

The South African Children with HIV Early Antiretroviral Therapy (CHER) trial revealed that HIV-related death was significantly reduced by four-fold when HIV infected children aged less than 12 weeks were initiated on antiretroviral therapy (ART) at the time of diagnosis irrespective of their immunological or clinical stage status as opposed to those enrolled on ART based on WHO recommendations (Violari et al, 2008). The results of this study led to revision of WHO guidelines in 2008 recommending starting ART in infants but later extended to HIV infected children less than 2 years (WHO 2008 and 2010). The WHO 2013 guidelines now recommend treating all HIV infected children less than five years of age. Implementation of these guidelines is still a challenge especially among infants since the identification of HIV infected infants and children less than two years requires early infant diagnosis of HIV services that are still not readily available or not utilized in most of the health facilities.

The WHO/UNAIDS global progress report 2013 showed that only four out of the 22 priority countries in sub-Saharan had over 50% early infant diagnosis of HIV coverage in 2012. Despite the rapid expansion of early infant diagnosis of HIV services in a range of countries, there are still bottlenecks impeding their utilization, including late identification of HIV-exposed infants, poor integration of EID services in child health services, long turnaround time of DNA/PCR results and non-existence of ART for HIV infected children (Chatterjee et al and Ciaranello et al, 2011).

In Uganda, since its initiation at the end of 2006, EID services have been scaling up in terms of health facility coverage. Coverage per health facility is about 100% of all hospitals and HC IVs

and over 80% of HC IIIs and a few HC IIs. Despite, the availability of EID services, only 57% HIV exposed infants receive DNA PCR services (Uganda National EMTCT plan 2012-2015). Many children are left undiagnosed or diagnosed late that results into increased childhood HIV-related mortalities.

Therefore, the aim of this study is to determine the uptake of early infant HIV diagnosis and their related factors in Wakiso HCIV so as to inform the local health authorities to develop Strategies to improve uptake of early infant HIV diagnosis; and prevent morbidity and mortality in HIV infected children.

Problem Statement

The World Health Organization 2010 guidelines on diagnosis of HIV infection in infants and children recommend that all infants born to HIV positive mothers should have a blood sample collected for Early Infant Diagnosis testing at four to six weeks of age.

In Uganda, Infant HIV testing is a primary element of PMTCT efforts. The Uganda current National Plan for Elimination of Mother to Child transmission of HIV 2012-2015 targets 80% of infants born to HIV positive women to receive a virological HIV test (DNA-PCR) by 2 months of age.

The early identification of all children infected with HIV is an essential component to child survival. All HIV exposed infants should be tested, even if their mothers received antiretroviral drugs for EMTCT. In infants and children, HIV infection follows a more aggressive course unlike adults (Newell 2004).

To diagnose HIV infection definitively in children aged <18 months, there is need for DNA PCR services that are available in Uganda at the MOH Central Public Health Laboratory (CPHL); and a number of PMTCT sites have the facilities to take off dry blood spot (DBS) samples from HIV exposed infants and forward them to the central processing laboratory for DNA PCR analysis. However, the utilization of these services at various health facilities is suboptimal. According to the Uganda National Plan for Elimination of Mother to child Transmission of HIV 2012, only 34% of the expected HIV exposed infants received EID services. There is need to reach 100% of all HIV exposed infants with HIV testing services. The low uptake of EID services leaves many of the HIV-infected children undiagnosed hence lead to increased childhood HIV-related morbidity and mortality.

In Wakiso district, EID service provision started in 2008 but its coverage in terms of proportion of HIV exposed infants reached is not clearly known. This study will determine the magnitude and identify the various factors affecting the uptake of early infant diagnosis of HIV services at Wakiso HCIV so that strategies to address the existing gaps may be proposed.

Objectives of study

General objective of the Study:

- To determine the magnitude and the factors affecting uptake of early infant diagnosis services at Wakiso HCIV, Wakiso districts.

Specific objectives

1. To determine the level of uptake of early infant diagnosis of HIV services at Wakiso HCIV, Wakiso district
2. To establish socio-demographic factors of caregivers associated with uptake of early infant diagnosis services at Wakiso HCIV
3. To assess the caregiver factors affecting uptake of early infant diagnosis services at Wakiso HCIV
4. To assess the health facility factors affecting the uptake of early infant diagnosis services at Wakiso HCIV

Research questions:

1. What is the proportion of HIV testing among HIV exposed infants?
2. What are the socio-demographic factors of caregivers associated with uptake of early infant diagnosis services at Wakiso HCIV?
3. What are the caregiver factors affecting uptake of early infant diagnosis services at Wakiso HCIV
4. What are the health system factors that influence utilization of DNA PCR HIV testing services?

Study Justification

HIV infected infants can only be identified and given the recommended essential care package if there is access to EID services. HIV disease progression and death among infants is much higher than adults, even with a relatively high proportion of CD4 T lymphocytes (Dunn D et al 2003).

Over 50% of HIV-infected children die before celebrating their second birth day (Newell et al 2004). For In order HIV infected children to receive essential treatment and care, early and accurate HIV diagnosis is a critical intervention. The identification of these infants, and all children living with HIV, and provision of essential health services, including HIV care and treatment services when needed, will translate into real progress on child survival.

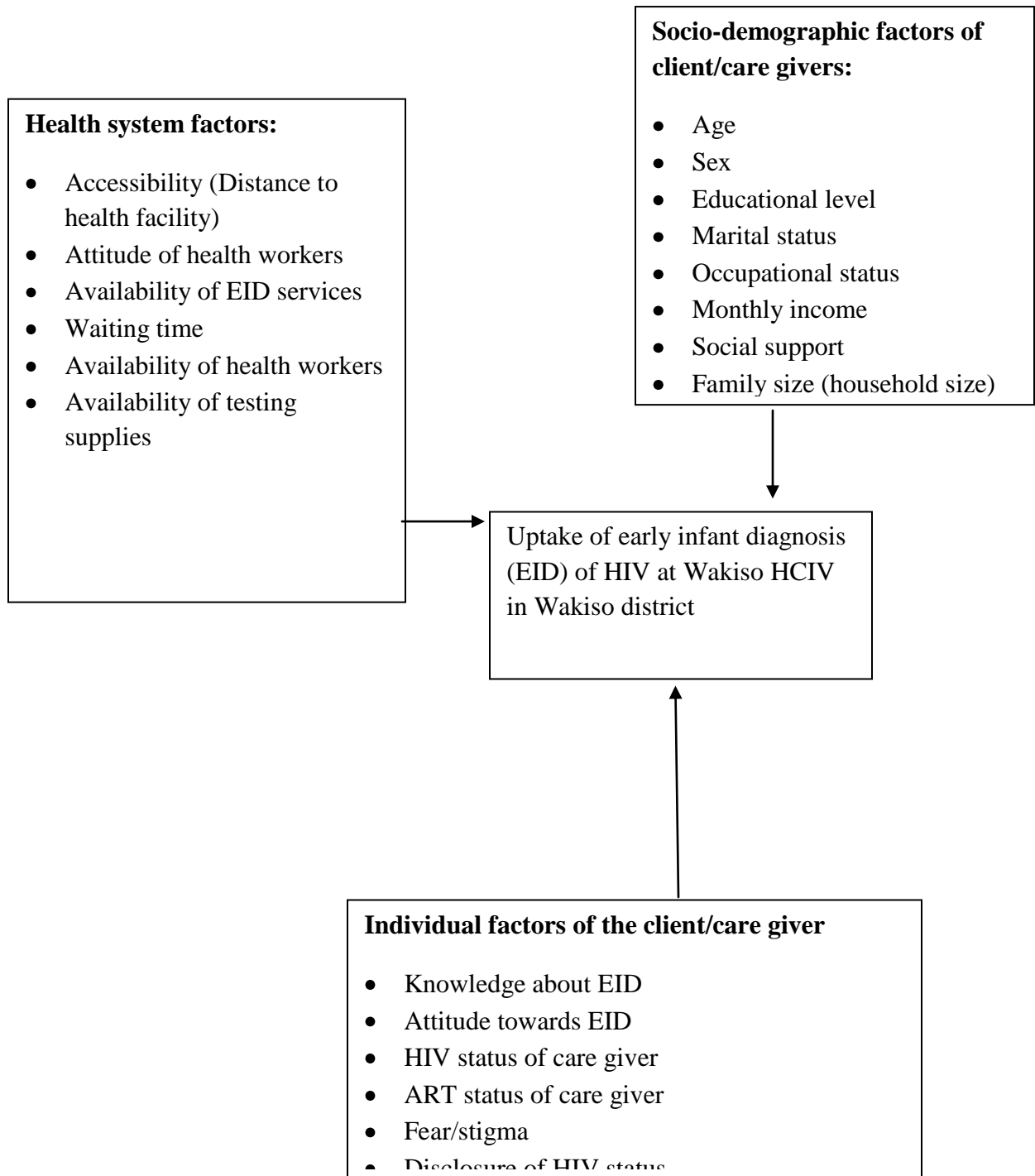
EID for HIV infection is relatively a new program in which no much is known regarding the extent of its utilization and the several factors that are associated with EID implementation which should be considered during the program strengthening.

The results and recommendations will be shared at different levels of the district health service delivery system (health facility, health sub-district and district) to facilitate redesigning of strategies to enhance utilization of early infant diagnosis of HIV services in various PMTCT sites in Wakiso district.

Implication on nursing practice

Early identification of HIV infected children and effective management decreases their morbidity and mortality. Early treatment of HIV infected children improves their overall health status and quality of life, with less frequent opportunistic infections, making fewer visits to health facilities to seek medical care and hence reduced workload to health workers and nursing needs. This also increases the overall productivity, reduced disease burden and cost.

Conceptual framework of factors affecting uptake of Early Infant Diagnosis services at Wakiso HCIV



The conceptual frame work is further described below:

Numerous factors influence the uptake of DNA PCR testing services among the HIV exposed infants. These factors are related to the health system, mother/care takers, and the social-economic environment in which the infant is born, that is, there is an interplay of several factors before a decision is reached to bring an HIV/AIDS infant is brought for a DNA PCR HIV testing. For example; age, education, parity, occupation, disposable household income and distance of residence from the health facility of the mother or caregiver play a key role in decision making as whether to bring the infant for DNA PCR testing. Mothers knowing their HIV status and disclosure of HIV sero-status to sexual partners are critical in increasing the effectiveness of PMTCT of HIV and the subsequent care of the HIV/AIDS exposed infant. The study will focus on identifying socio-demographic, individual client/caregiver and health service factors that are associated with uptake of early infant diagnosis of HIV in Wakiso HCIV in Wakiso District.

CHAPTER TWO: LITERATURE REVIEW

Introduction

In this chapter, related literature on the proportion of HIV testing (DNA PCR) among HIV exposed infants and factors affecting utilization of EID of HIV infection will be summarized.

HIV/AIDS still threatens the child survival with about 50% of HIV infected children dying before the age of two years without access to antiretroviral therapy (Newell et al 2004). With the advent of early infant diagnosis of HIV techniques; and increased access to HIV care and treatment services significant child survival rates have been recognized (Violari 2008). However, early infant diagnosis of HIV services coverage is still in poor in low and middle-income countries with only four countries among the 20 sub-Saharan Africa priority countries registering over 50 EID coverage (WHO/UNAIDS global progress report 2013).

Current status of the Care for HIV Exposed Infants and EID services in Uganda

The Uganda National Child Survival Strategy 2009 recommends early infant diagnosis of HIV services among the essential care package HIV exposed infants. Before 2006, HIV diagnosis among children less than 18 months was a challenge due to non-availability of EID services in the country. The EID programme in Uganda started in 2006 that enabled testing of HIV exposed infants for HIV using the DNA-PCR technology with establishment of eight regional DNA-PCR laboratories countrywide and setting up a blood collection sample transportation network using Posta Uganda as a courier.

The coverage of early Infant diagnosis of HIV services has increased over the years from 7 health facilities testing only 110 infants in 2006 to over 800 health facilities providing EID services and close to 45,000 babies tested in 2010. All hospitals and health centre IVs; and about 80% of the health centre IIIs were providing EID services (National Plan for Elimination of Mother to child Transmission of HIV 2012).

Uptake of EID Services

As of November 2011, there were a total of about 1167 health facilities actively collecting and referring DBS samples for HIV testing, with at least one health facility in each district.

Cumulatively, over 150,000 infants have been tested as of November 2011 for HIV and over 15,000 have been identified as HIV-infected. The average age at 1st PCR test is 7.2 months. In 2008, about 17,630 HIV-exposed infants received EID services from 285 health facilities. In 2009, 34,606 HIV-exposed infants were tested for HIV from 550 health facilities providing EID. However, this was only 34% of the expected HIV exposed infants that received EID services. There is need to reach 100% of all HIV exposed infants with HIV testing services (Uganda National Plan for Elimination of Mother to child Transmission of HIV 2012).

Some studies had been conducted to estimate the coverage/proportion of HIV testing among HIV exposed infants.

According to a prospective observational cohort study on diagnosing HIV infection among infants done in Academic hospital in Johannesburg, South Africa; the proportion of HIV exposed infants that had DNA-PCR done by six weeks of age was 85%. In this study, sample size of 848

mother-infant pairs was used and these were recruited and followed-up. All HIV positive pregnant women who consented to participate in the study at the PMTCT clinic of the hospital were enrolled into the study. These women while pregnant were managed as per PMTCT guidelines. When they delivered their infants together with the mothers also received routine PMTCT services as per South Africa's 2008 PMTCT guidelines. All HIV exposed infants were tested for HIV using DNA-PCR technology at six weeks of age (Lilian RR et al 2013).

In a descriptive observational study conducted at the Arthur Davidson Children's Hospital in Zambia on Analysis of HIV Early Infant Diagnosis Data to Estimate Rates of Perinatal HIV Transmission, the majority of HIV exposed children (58.6%) had a PCR test done between age six weeks and six months. This study reviewed service data from 28,320 HIV exposed infants from five Zambian provinces (Central, Copper belt, Luapula, North-Western, and Northern Provinces) to estimate MTCT rates. This study analyzed all DNA PCR results and PMTCT data from perinatally exposed children 0 to 12 months of age seen at this hospital. There was no sample selection; all PCR results and PMTCT data available were considered in this analysis (Torpey K et al, 2012). In this study, there was no randomization. It covered all children born to HIV positive mothers within the targeted study period. In the study I intend to conduct, study participants will be selected by simple random sampling. This allows generalization of the study results.

Approaches to Early Infant Diagnosis of HIV

Goal of HIV testing in Infants

The primary goal of early infant diagnosis is not to exclude HIV infection in infants but to identify HIV infected children early, before its progression to symptomatic disease during the

first months of life. Early infant testing as early as six weeks detects most infections acquired during pregnancy, delivery and early breast-feeding. This approach allows early treatment of the estimated 20 % of the infants that acquire HIV infection during pregnancy or birth or during breast-feeding periods who may die before six months of age without ART (Newell et al, 2004).

EID Testing Strategies

For children less than 18 months, HIV definitive diagnosis can only be done through virological testing that includes nucleic acid testing using polymerase chain reaction assays (both qualitatively [DNA and RNA] and quantitatively [RNA]), and p24 antigen quantitation. Unlike adults, it is not possible to conduct rapid HIV serological tests on young children due to presence of maternal HIV antibodies in their circulation that might give a false HIV positive result. This DNA-PCR technology uses dried blood spots (DBS) that allows easy storage and transportation to sample processing laboratories so providing a means in resource-poor settings for early infant diagnosis.

Since the introduction of the DNA-PCR technology, WHO, UNICEF and CDC recommended that all countries should increase access to early infant diagnosis of HIV services to facilitate early identification of HIV infected infants to allow their timely initiation on antiretroviral therapy.

Barriers to access and utilization of DNA PCR HIV testing of HIV exposed infants

According to a cross-sectional study conducted in Kibaha and Bagamoyo districts in Coast region in Tanzania, involving all HIV-exposed infants aged between 4 weeks to 18 months born live to HIV-infected mothers using a sample size of 239 respondents; monthly attendance to HIV

EID clinic predicted significantly the testing among HIV-exposed infants. However, cotrimoxazole prophylaxis was not a predictor for HIV testing among exposed infants. Other factors found to predict testing of HIV-exposed infants were: early HIV testing during pregnancy, PMTCT ARV prophylaxis, and disclosure of HIV status, enrollment to care and treatment center, and exclusive breastfeeding (Gregory G.J 2012).

However, this study only assessed for availability of EID services and health facility resources key to EID service provision but not whether and how they affect utilization of EID services. The study didn't use qualitative methods to study the health facility and caregiver/mother factors in depth. The study was also conducted in a different country. The study I conducted in Wakiso employed quantitative methods; and studied the influence of health facility factors on utilization of EID services.

Health facility factors that can influence uptake of DNA PCR testing services

Health care system must provide necessary support in the cascade of HIV early infant diagnosis. A well-defined system of mother-infant pair follow up including using of immunization cards to identify HIV status, availability of national guidelines, trained health care providers and supervised and provided with tools will ensure that HIV-exposed or infected children are identified and enrolled into care.

A health facility survey conducted in Kenya in 2005 as part of optimizing pediatric HIV care in Kenya focusing on challenges in early infant diagnosis at 58 health facilities and reviewing existing government policies identified the weaknesses in the structures for systematic diagnosis of HIV through laboratory or clinical-based algorithms; inadequate systems for quality control in

the laboratories; and shortage of staff as the major hindrances to provision of EID services. In this assessment, a convenient sample of 58 ART sites was selected from among health facilities providing ART services in eight provinces. Data was collected using a standard tool of structured questions and checklists. The study also collected qualitative data through key informant interviews. Other key findings included: lack of client held records indicating HIV exposure status of infants; absence of national HIV testing guidelines in these sites; lack of trained health workers to collect DBS samples; and no HIV testing algorithm charts (Cherutich et al, 2008). However, this study focused on assessing the health system factors without focus on the individual client or care giver factors that could affect utilization of EID services.

According to Kiyaga et al (2010), review of EID strengthening program in Uganda indicated that significant efforts in training health workers to provide EID services reduced the average age at testing across all sites from 7.4 months to 6.1 months within 2 years. This review recommended that health care workers must adapt with increased demand on the time, acquire and sustain EID skills and knowledge while maintaining optimal attitudes and practice towards caring of HIV exposed infants. EID of HIV is integrated in PMTCT settings and its strengthening is still ongoing in both urban and rural areas of Uganda. It is important to sustain health workers performance reflected by knowledge acquired, attitudes and practices and accommodation of increasing workload. Provision of adequate education and counseling to all pregnant women on importance of EID is important and health care system should be improved to support implementation of EID avoiding unnecessary service interruptions.

Success of EID in any settings depends on the extent that the health system, healthcare providers, the clients and respective communities support its implementation.

Availability of human resources

DBS sample collection needs to be performed by trained health workers. In addition to this, they should be adequate enough in facilities so as to overcome the problems of work overload. Staff shortages have been reported to significantly affect the quality of services especially HIV counseling that takes a long time to do well. (http://www.unicef.org/evaldata_base_index_2968.htmlj). Accessed 2/5/2014.

A Systematic review of public health research on prevention of mother-to-child transmission of HIV in India with focus on provision and utilization of cascade of PMTCT services identified barriers to accessing PMTCT/EID services that included: absence of trained health workers and poor attention to social and gender issues and perceived stigma and discrimination in health facilities. This search using MEDLINE, US National Library of Medicine Gateway system (PubMed) and ISI Web of Knowledge yielded 1,944 abstracts, and 167 were selected based on inclusion criteria. However, only three published studies, focused on the barriers to accessing PMTCT/EID services (Shrinivas D et al 2012).

Attitude of health workers

According to World Health Organization literature review on experiences of women for PMTCT services; revealed suboptimal interactions between health workers and their clients, many described health workers as uncaring and others discriminating. This was conducted through a

systematic search of published literature collected between January 1, 2000 and November 15, 2012. This resulted into 1740 articles that were reviewed and 75 abstracts selected for full-text review, 31 of them fitted within the set criteria. From manual searches three additional publications were got and included giving a total of 34 publications (WHO 2013).

One qualitative study in Viet Nam and Indonesia on Prevention of Mother To Child Transmission explored local dynamics of care, using a mixture of focus group discussions, observations and interviews. It registered discriminatory and unkind behavior among health workers revealed by 96% women (Hardon, A.P. et al. 2009). In another qualitative study conducted in the district of Bagalkot, Karnataka, India on Stigma as experienced by women accessing PMTCT services, it reported women shunning away from PMTCT services at the health facilities due to discriminatory behavior of health workers including judgment of morals, abusive language and behavior; and treatment refusal. In-depth interviews and focus group discussions were conducted with HIV-infected women that had been enrolled in the PMTCT program, their family members, and health workers (Rahangdale, L. et al. 2010).

Availability of drugs and HIV exposed infants care services

In settings where HIV treatment services for children are non-existent, testing of HIV exposed infants as early as six weeks may confer little benefit. The caregivers may not perceive it to be of any use. Other factors that may influence the decision to have HIV exposed infants tested include; whether the infant has postnatal exposure through breast feeding and the effect of early weaning on the survival of the HIV infected children. In situations where majority of HIV positive women breast-fed without PMTCT interventions, new infections occurred throughout

breastfeeding period. Infant testing therefore may be perceived to be of no importance (Piwoz et al, 2005).

Distance

Long distances limit the willingness and ability of individuals in seeking health care particularly when appropriate transportation is scarce and terrain is difficult.

According to a respective cohort study done by Cook RE et al 2011 on predictors of successful early infant diagnosis of HIV in a rural district hospital in Zambézia, Mozambique; three quarters of HIV-infected women never brought their children EID services. The predictors of follow-up for early infant diagnosis were greater distance from hospital, independent maternal source of income and larger household size. This was a retrospective cohort study that recruited 443 HIV-infected mothers and their infants as participants. However, this study didn't dwell so much into general health system factors that affect utilization of EID services that my study will explore.

Socio-demographic factors and HIV testing in infants and young children

The demographic characteristics of both mothers and children are critical in child survival. These include:

Age

A retrospective cohort study conducted in Mozambique in the districts of Alto Molo´cue` and Namacurra on improving retention in the EID program revealed no significant association between EID and maternal age. This study used a sample size of 395 HIV-infected women who had live births at the hospital and their infants. This study used two cohorts of mother/infant pairs: one pair had received standard referral to EID at the time of discharge from labor and delivery and another pair had received enhanced referral (Philip J et al, 2011).

Education

According to a prospective study done at Queen Elizabeth Central Hospital Blantyre, Malawi on predictors and impact of losses to follow-up of infants born in a large cohort of delivering women in urban Malawi, there was strong evidence that infants born to mothers of lower education status are more likely to be loss to follow up. Ability to read and formal education increased more access to information and knowledge with increased utilization of services while more engagement in agricultural activities especially poor communities may have less access to education and hence poor health seeking behavior. In Malawi, less educated mothers and those from farming communities are less likely to attend HIV exposed infant follow up clinic for early infant diagnosis of HIV services. This cohort was constituted as part of the vaginal chlorhexidine cleansing trial during delivery for PMTCT. This was a prospective study followed up all live births to HIV infected pregnant women that delivered at Queen Elizabeth Central Hospital Blantyre. The study considered clients from greater Urban Blantyre. The other factors that were predictors of loss to follow up were:

The only maternal occupation associated with high rates of loss to follow up was teaching. Among occupation practiced by fathers, significant loss-to-follow up were also observed among farmers and teachers. Independent biological predictors of loss to follow up include low birth weight and twins with better follow up than singletons (Ioannidis et al, 1999). However, this study was restricted to clients residing close to the hospital and in urban Centre. The identified factors could be different for the clients in Wakiso where I conducted my study.

Occupation

Occupation can bridge the gaps of costs associated with accessing DNA PCR testing services by economically empowering PMTCT mothers or caregivers of HIV exposed infants.

According to a prospective study done at Queen Elizabeth Central Hospital Blantyre in Malawi on predictors and impact of losses to follow-up of infants born in a large cohort of delivering women in urban Malawi, the only maternal occupation associated with high rates of loss to follow up was teaching. However, there was significant heterogeneity in rates of losses for different paternal jobs. Among occupation practiced by fathers, significant loss-to-follow-up was observed among farmers, teachers and student (Ioannidis et al, 1999). This was a prospective study that recruited live births born to HIV infected women in Central Hospital in Blantyre, Malawi. The study environment of my study in Wakiso was not a city centre.

Caregiver Income

According to respective cohort study done in Mozambique on Predictors of successful early infant diagnosis of HIV in a rural district hospital in Zambézia, maternal income was identified

as a significant predictor for uptake of EID services. This study followed a cohort of 443 HIV-infected mothers and their infants who were selected through review of records at Alto Molócuè district hospital. The inclusion criteria considered all HIV-positive women who had been enrolled in the hospital PMTCT program and their infants were due for early infant diagnosis of HIV services. The study reviewed the clinic registers to determine the mother's HIV status and their enrollment in the PMTCT program and HIV testing status of the HIV exposed infants. (Cook RE et al 2011).

This study, however, selected all the eligible clients at the hospital without randomization. It didn't also study the health facility factors affecting uptake of EID services. The study I will conduct in Wakiso will use simple random sampling approach and it will assess the health facility factors.

Social support

Social support can bridge the barriers encountered in accessing health care including getting money to pay for treatment, transport and other costs associated with getting HIV exposed infants getting tested for HIV.

In a qualitative study conducted in three clinics in Blantyre, Malawi on barriers affecting participation by HIV-infected Women in HIV care programs identified five major themes: lack of psychosocial support, inadequate knowledge of early infant diagnosis of HIV and infant antiretroviral therapy, poor perception of health workers, fear of HIV status disclosure as main determinants of non-participation in EID programs. This qualitative study involved 59 HIV-

infected women and assessed barriers to utilizing EID services. In this study, in-depth information was on the barriers to participation in EID and infant ART programs.

The study revealed that most women reported receiving very few psychosocial supports, resulting in isolation and sadness. Many women articulated their beliefs that stress from illness and lack of social support directly contributes to poor health outcomes for themselves and their infants. Even though all women reported a religious affiliation (mostly Christian), very few received church-related social support. It was not clear if this occurs because women do not disclose their status to church members or because some community religious leaders openly preach that HIV-infection results from sinful behavior. The Malawian women highlighted the negative effects of the lack of social support on their health and the health of their infants (Marie CD et al 2012).

One of the limitations of this study is that it included only women who engaged in care and not women who had defaulted EID. Second, two of the three sites were involved in research, which may limit the generalizability of the findings to more typical settings characterized by crowding and long waiting times. This was also a qualitative research whose results may not be generalized. However, the study I conducted was quantitative study carried out in typical government facilities that were not involved in any research at the time of the study.

Family size (household size)

A retrospective cohort study conducted in Mozambique in the districts of Alto Molo´cue` and Namacurra on improving retention in the EID revealed an independent association between EID

and increasing family size using the multivariable model. Family size was identified to be critical in facilitating client retention and successful follow-up. This study used a sample size of 395 HIV-infected women with live births with their infants at a study hospital. Two cohorts of mother-infant pairs were selected: those that received standard referral to EID at the time of discharge from maternity and those pairs that received enhanced referral (Philip J et al, 2011).

Individual factors of client/caregiver

HIV disclosure status; Fear/Stigma

A meta-analysis study by Ciaranello et al 2011 on early infant HIV-1 diagnosis programs in resource-limited settings: opportunities for improved outcomes and more cost-effective interventions found out that knowledge of HIV positive status of the mothers may not necessarily mean that this information will be shared with health care service providers. Poor HIV disclosure among partners and non-maternal caregivers have been linked to underutilization of EID as awareness of infants exposure status may not be known hence lack opportunity to serve these children. If there is no HIV disclosure to fathers and caregivers other than mothers, this can lead to poor understanding of the importance of EID services. This was a review of many studies conducted on EID in many settings in developing countries. Some of the findings may not be specific to Wakiso setting.

According to UNICEF/WHO 2008 programming frame work on scale up of HIV Prevention, Diagnosis, Care and Treatment for Infants and Children; parents may be reluctant to take their child for an HIV test for fear that the child will face discrimination once diagnosed. A lack of knowledge about testing can lead to poor testing rates. Mother who has not yet been tested may

be fearful to know her child is infected as it would mean she is likely HIV-infected (UNICEF/WHO, November 2008).

Care-giver HIV status

Maternal status is determined by ensuring HIV testing to pregnant mothers or mothers who had no HIV test during pregnancy, the status is then recorded in the antenatal clinic (ANC) card and later transferred to immunization health card/mother's passport. When an infant is brought to the clinic the health care providers look for HIV status in child's immunization card and link the exposed infants for HIV testing. This facilitates early identification of HIV exposed infants and gets them tested for HIV as early as six weeks. However, if the mother's status is not known, it may delay identification of the exposed infants and hence no linkage to EID care point for exposed infant services. If the child is brought by a person other than mother and the status of exposure is unknown, the health care provider may take blood for antibody test. If the test would be reactive the child has passively acquired maternal antibodies, thus would be at risk for HIV infections and will be linked to HIV testing services (Report of a pediatric HIV Care and treatment assessment in the Kilimanjaro, Iringa and Mbeya regions of Tanzania, 2006).

Antenatal and post natal care attendance/Knowledge of EID

The main objective of ANC is to screen for pregnancy-related complications; manage and treatment any infections identified; and provide and health education on a range of issues including taking an HIV test, place of delivery and referral of mothers with complications

including where to take HIV exposed infants for testing. Mothers that attend the recommended four ANC visits can therefore be in position to have all these issues discussed than those who don't. The health facility where pregnant women attend antenatal care influences the attendance of ANC and quality of care and received. This therefore has a bearing on utilization of EID services

Post natal care is a critical component of maternal and child health services as it creates a platform for continued health education on how to care for an infant, identify and manage complications and provision of early infant diagnosis of HIV services to the exposed infants. Factors that have been found to influence postnatal attendances include being young, first order births, urban women, better education and health facility delivery (UDHS, 2006).

ART status of caregiver

According to a respective cohort study done by Cook RE et al 2011 on predictors of successful EID in a rural district hospital in Zambézia, Mozambique, three quarters of HIV-infected women in rural Mozambique never brought their infant for EID services. Receipt of ART by the mother of the HIV exposed infant increased the likelihood of uptake of EID services. The other factors significantly associated with uptake of EID services were larger household size, independent maternal source of income and greater distance from the hospital. This was a retrospective cohort study that involved 443 mother-baby pairs. However, this study didn't dwell into the health system factors that affect utilization of EID services that my study explored.

A study conducted in Malawi by Kim MH et al 2012; the Tingathe programme: a pilot intervention using community health workers to create a continuum of care in PMTCT services in Malawi, found out that not being on antiretroviral therapy when eligible, was significantly

associated with non-completion of the PMTCT cascade while delayed enrolment in pregnancy and having a non-involved partner were significantly associated with PMTCT cascade completion. This pilot took place in two large peri-urban communities (Area 25 and Kawale), in Lilongwe. This was a prospective study that stretched over 24 months with 1688 HIV positive pregnant women recruited. Retention in care; and outcomes of HIV positive pregnant women were evaluated in this pilot. This study focused on assessing the maternal factors affecting PMTCT cascade completion. However, the study I conducted in Wakiso focused beyond maternal factors including health system factors that may be related to EID service utilization.

The available literature highlights findings from studies done in research settings and mainly in urban or typically rural settings. EID is relatively a new service in Uganda and comprehensive studies have not been done to study the factors affecting uptake of EID services.

This study explored factors affecting uptake of EID services at Wakiso district that can guide the district health team and the stakeholders to develop strategies to address the identified gaps and strengthen health care delivery system that offers the recommended essential package for HIV exposed and infected children for increased child survival.

CHAPTER THREE: METHODOLOGY

Introduction

The chapter describes the main methodological aspects that the study followed. The aspects include the study design, study population, study area, sample size calculation, sampling procedure, study variables, data collection technique, data collection tools, plan for data analysis, quality control measures, ethical issues, study limitations and dissemination plan as explained in the chapter.

Study design:

This was a cross-sectional study employing quantitative methods. Cross-sectional study was more appropriate for this study because it is easy to use and determine the percentage utilization (prevalence of uptake) of EID services. It was quantitative study because I wanted to determine the level of uptake of EID services and can use statistics to generalize findings. This study determined the prevalence of HIV among studied exposed infants and young children but also determine factors which were associated with utilization of EID for HIV infection.

Study area:

The study was conducted at Wakiso HCIV in Wakiso District.

Wakiso district is located in Central Uganda. In the north, it borders Nakaseke and Luweero Districts, Mukono to the east, Kalangala to the south, Mpigi to the southwest and Mityana to the northwest. The 2013 midyear population was 1,400,000 people.

There are 105 health units; both Government-owned and Non-Governmental organizations. Out these, 54 health units provide EID services. HIV prevalence for the district is 10.6% (Uganda

AIDS Indicator Survey 2011). Expected annual pregnant women are 70,000 while expected HIV positive pregnant women are 7,420.

Wakiso HCIV where the study was conducted is located in Wakiso town council, Busiro East in Wakiso District and it is government-owned facility. It has a catchment population for this financial year 2013/2014 of 68,400 people. The facility provides a range of delivery of promotive, preventive and curative services; including maternal and neonatal child health services; PMTCT/EID services, general HIV care and treatment; out-patient, in-patient, Mental health services, surgeries for both emergency surgical and obstetrical cases, Tuberculosis management services; laboratory services; diabetic clinic and dental services.

Population:

Target population: All caregivers of HIV exposed infants aged between 6 weeks and 18 months; in Wakiso district.

Accessible population: All caregivers of HIV exposed infants aged between 6 weeks and 18 months in Wakiso district attending EID care services at Wakiso HCIV.

Study population: It included all HIV exposed infants aged between 6 weeks and 18 months; and care-givers/mothers of these infants who bring their infants for EID services at Wakiso HCIV and consent to participate in the study.

Sample size determination:

The sample size is determined using the Kish and Leslie formula for respondents that stipulates that

$$\text{Sample size, } n = Z^2PQ/E^2$$

Where Z = value corresponding to 95% confidence interval. For a normal distribution curve, $Z = 1.96$

- P = Variable of interest= proportion of HIV exposed infants that accessed 1st DNA PCR is 85% from a prospective observational cohort study on diagnosing HIV infection among infants done in Academic hospital in Johannesburg, South Africa ((Lilian RR et al 2013).
- $Q = 1 - P$. $Q = 1 - 85\% = 15\%$ or 0.15
- E = Degree of precision = 5%
- On substitution; $n = [(1.96)^2 \times 0.85 \times 0.15] / (0.05)^2$
- Therefore, sample size $n = 196$ respondents

Sampling procedure

Consecutive sampling method was adopted to enroll every caregiver of HIV exposed infant engaged six weeks to 18 months who come to health facility for EID services and consent to participate until the require sample size was achieved. This sampling method included all available, accessible and eligible subjects that came to the immunization and mother-baby care clinics as part of the sample.

Inclusion criteria

- ✓ All care-givers/mothers of HIV exposed infants who consent to participate in this study will be recruited

- ✓ All care-givers/mothers of HIV exposed infants/children between 4 weeks to 18 months seeking health care services at Wakiso HCIV.
- Exclusion criteria
 - ✓ Unstable clients like those who too sick to respond.

Study Variables

Dependent / outcome variables

The primary outcome is a respondent reporting having taken an HIV exposed infant when six weeks to 18 months of age for DBS sample collection for DNA PCR HIV testing. This was dichotomized into having taken an HIV exposed infant for DNA PCR HIV testing on time (when the infant was between six to eight weeks of age) or not.

Independent / exposure variables

Socio-demographic factors: Age, sex, marital status, level of education, occupation, monthly income and social support

Individual factors of the client/caregiver: Knowledge about DNA PCR HIV testing services, attitudes towards EID services, HIV status of caregiver, ART status of caregiver, disclosure of HIV status and fear/stigma.

Health facility factors including availability of health workers trained to provide EID services, health providers' attitude towards EID services, availability of EID services, availability of logistics for DBS collection, availability of drugs and other services for HIV positive mothers, accessibility (Distance to health facility), waiting time

Data collection

▪ **Data collection tools**

Data collection tool (semi-structured questionnaire) was developed to collect data from the caregivers/mothers. Data was collected using the following methods:-

▪ **Structured interview**

HIV-exposed infants brought to the health facility for immunization, growth monitoring and other child health services were identified by checking their exposure status in their immunization cards. All caregivers/mothers of HIV exposed infants who consented to the study were interviewed using a standardized questionnaire.

The investigator was assisted by one research assistant to collect the data.

Data management

- ✓ Data editing was done daily, then data coding and entry. Data entry was done using epidata version 3.1 by the principal investigator. Data validation was done. Univariate analysis was done to generate frequency tables and other descriptive measures about the study participants. Data was analyzed using Epidata analysis for the descriptive analysis, Micro soft office excel 2003 mainly for graphs and SPSS version 12.0 for the cross tabulations.
- ✓ Bivariate analysis: The association between EID HIV testing (dependent variable) and other factors (independent variables) will be assessed using chi-square. P-value of less than 0.05 was considered as statistically significant.

Quality control

The principal investigator identified a research assistant; who was a trained counselor at a diploma level; because of the sensitive nature of the topic, from Wakiso health Sub-districts with good knowledge of the local language. She was briefed on the objectives of the study and was trained on interview skills, correct recording of responses, data collection methods and study objectives.

The principal investigator and the research assistant was pre-tested the questionnaires before actual data collection for purposes of validating the questionnaires and ensuring its suitability for interviewing respondents. These were analyzed and then adjustments were made accordingly.

Supervision of the research assistant was done to check on the data accuracy, consistency and completeness and to correct any mistakes. In the process, the necessary corrections were made.

While doing questionnaire designing in the database, checks were put in place to avoid mistakes during data entry.

Ethical consideration

- To carry out the study, I got approval from International Health Sciences University
- I sought for permission from Wakiso District Health Officer and Health Facility In-charge.
- Informed written consent was obtained from all the study respondents.
- Confidentiality of information was ensured right from data collection as respondents were not to have their names written on the questionnaires and all the questionnaires were kept daily by the principal investigator.

Dissemination of results

- The results of the study will be submitted to International Health Sciences University in a form of a dissertation, to Wakiso District Health Officer and Health Facility In-charge, and for possible dissemination to the community.

CHAPTER FOUR: RESULTS

Introduction

This chapter highlights the results of this study assessing the level of uptake of EID services and the associated factors.

Socio-demographic characteristics of the respondents

These results were generated from a total of 201 participants. The mean age for the HIV exposed children was 7.77 months with a median of 7.0 months. The majority 113(56.2%) of the HIV exposed children were females. The mean age for the respondents was 27.86 years, ranging from 16 to 83 years. The females constituted the majority of respondents at 196(97.5%) of the total respondents. More than half 118 (58.7%) of the respondents had gained primary education as opposed to 20(9.9%) with tertiary education. All the social demographic characteristics are as shown in table below.

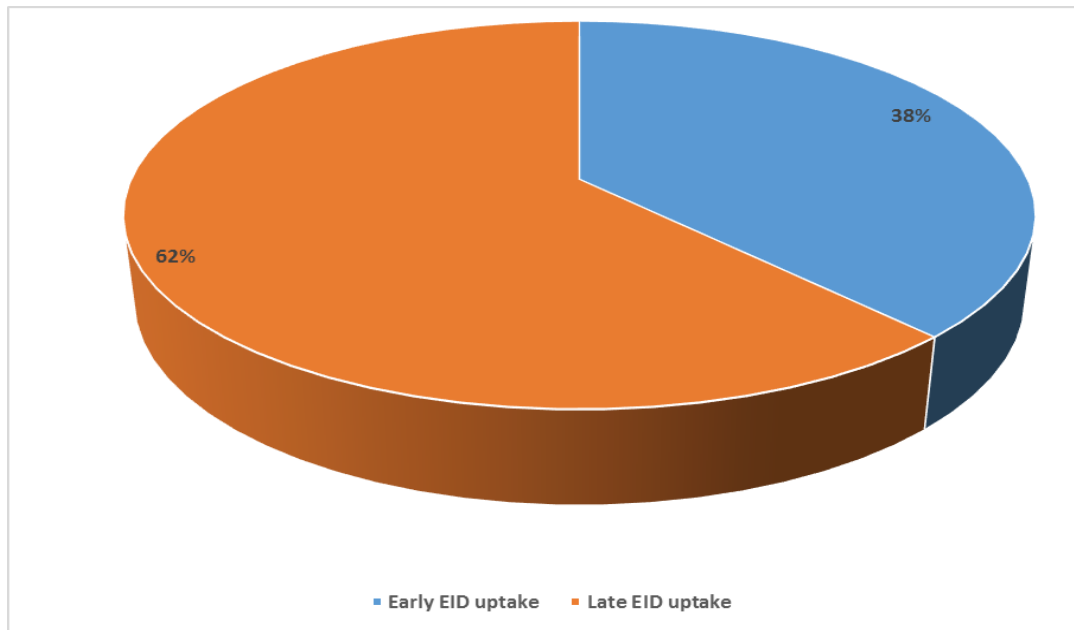
Table 1: Socio-demographic characteristics of caregivers

| Variable | Category | N | Percentage |
|--------------------|---------------|-----|------------|
| Age (years) | ≤26 | 111 | 55.2 |
| | >26 | 90 | 44.8 |
| Sex | Male | 5 | 2.50 |
| | Female | 196 | 97.5 |
| Relation | Mother | 190 | 94.5 |
| | Father | 2 | 1.0 |
| | Guardian | 9 | 4.5 |
| Education | None | 8 | 4.0 |
| | Primary | 118 | 58.7 |
| | Secondary | 55 | 27.4 |
| | Tertiary | 20 | 10.0 |
| Occupation | Peasant | 46 | 22.9 |
| | Business | 70 | 34.8 |
| | Salary earner | 3 | 1.5 |
| | Housewife | 82 | 40.8 |
| Marital status | Single | 45 | 22.4 |
| | Married | 121 | 60.2 |
| | Divorced | 28 | 13.9 |
| | Widowed | 7 | 3.5 |
| Family size | ≤6 persons | 159 | 79.1 |
| | >6 persons | 42 | 20.9 |
| Number of children | ≤4 children | 153 | 76.1 |
| | >4 children | 48 | 23.9 |
| Monthly income | ≤200,000 UGx | 191 | 95.0 |
| | >200,000 UGx | 10 | 5.0 |

Level of uptake of early infant diagnosis of HIV services

In this study, only 62% HIV exposed infants had been tested for HIV within the MOH recommended period of testing within two months of age. 38% had received DNA PCR testing late. Details are summarized in figure below.

Figure 1: The level of uptake of early infant diagnosis of HIV services at Wakiso HCIV



Socio-demographic factors of caregivers associated with uptake of early infant diagnosis services.

From this study, there are a number of socio-demographic factors on bivariate analysis associated with uptake of early infant diagnosis of HIV. The age of caregivers ($\chi^2=7.630$; $p=0.006$), type of caregiver ($\chi^2=8.791$; $p=0.003$), educational status ($\chi^2=14.255$; $p=0.003$), occupation of caregiver is significantly associated with earlier uptake of EID services ($\chi^2=15.021$; $p=0.002$), family size ($\chi^2=11.197$; $p=0.001$) and parity of caregiver ($\chi^2=9.667$; $p=0.002$) were found to be associated with EID as indicated in table 2.

Table 2: Socio-demographic factors of caregivers associated with uptake of early infant diagnosis services at Wakiso HCIV

| Variable | N (%) | Early EID (%) | Late EID (%) | χ^2 | p-value |
|--------------------|-----------|---------------|--------------|----------|---------|
| Age (years) | | | | | |
| ≤26 | 111(55.2) | 79(62.7) | 32(42.7) | 7.630 | 0.006 |
| >26 | 90(44.8) | 47(37.3) | 43(57.3) | | |
| Sex | | | | | |
| Male | 5(2.5) | 2(1.6) | 3(4.0) | 1.128 | 0.288 |
| Female | 196(97.5) | 124(98.4) | 72(96.0) | | |
| Caregiver | | | | | |
| Mother | 184(91.5) | 121(96.0) | 63(84.0) | 8.791 | 0.003 |
| Others | 17(8.5) | 5(4.0) | 12(16.0) | | |
| Education | | | | | |
| None | 8(4.0) | 5(4.0) | 3(4.0) | 14.255 | 0.003 |
| Primary | 118(58.7) | 62(49.2) | 56(74.7) | | |
| Secondary | 55(27.4) | 45(35.7) | 10(13.3) | | |
| Tertiary | 20(10.0) | 14(11.1) | 6(8.0) | | |
| Occupation | | | | | |
| Peasant | 46(22.9) | 39(31.0) | 7(9.3) | 15.021 | 0.002 |
| Business | 70(34.8) | 38(30.2) | 32(42.7) | | |
| Salary earner | 3(1.5) | 3(2.4) | 0(0.00) | | |
| Housewife | 82(40.8) | 46(36.5) | 36(48.0) | | |
| Marital status | | | | | |
| Single | 45(22.4) | 31(24.6) | 14(18.7) | 6.500 | 0.090 |
| Married | 121(60.2) | 79(62.7) | 42(56.0) | | |
| Divorced | 28(13.9) | 14(11.1) | 14(18.7) | | |
| Widowed | 7(3.5) | 2(1.6) | 5(6.7) | | |
| Family size | | | | | |
| ≤6 persons | 159(79.1) | 109(86.5) | 50(66.7) | 11.197 | 0.001 |
| >6 persons | 42(20.9) | 17(13.5) | 25(33.3) | | |
| Number of children | | | | | |
| ≤4 children | 153(76.1) | 105(83.3) | 48(64.0) | 9.667 | 0.002 |
| >4 children | 48(23.9) | 21(16.7) | 27(36.0) | | |
| Monthly income | | | | | |
| ≤200,000 UGx | 191(95.0) | 119(94.4) | 72(96.0) | 0.241 | 0.624 |
| >200,000 UGx | 10(5.0) | 7(5.6) | 3(4.0) | | |

Client/caregiver factors affecting uptake of early infant diagnosis services

Among the caregiver factors studied, uptake of the EID significantly depends on the following factors:

Knowledge related factors:

Caregivers' knowledge of age of child for EID ($\chi^2=42,586$; $p<0.001$), Awareness of frequency of EID ($\chi^2=49.442$; $p<0.001$), Awareness of when EID should be done in regard to the timing of pregnancy ($\chi^2=12.035$; $p=0.002$), Knowledge of benefits of EID ($\chi^2=11.810$; $p=0.003$). Knowledge that EID can detect HIV (attitude of caregiver) ($\chi^2=4.787$; $p=0.018$) and ART status of the caregiver ($\chi^2=4.787$; $p<0.05$).these factors are presented in table 3.

Table 3: Client/caregiver factors affecting uptake of early infant diagnosis services at Wakiso HCIV

Knowledge about EID

| Variable | N | Early EID | Late EID | χ^2 | p-value |
|---------------------------------|-----------|-----------|----------|----------|---------|
| Knowledge of age for EID | | | | | |
| Yes | 151(75.1) | 114(90.5) | 37(49.3) | 42.586 | <0.001 |
| No | 50(24.9) | 12(9.5) | 38(50.7) | | |
| Frequency of EID | | | | | |
| Once | 57(28.4) | 14(11.1) | 43(57.3) | 49.442 | <0.001 |
| >Once | 144(71.6) | 112(88.9) | 32(42.7) | | |
| Aware of EID | | | | | |
| Before pregnancy | 78(38.8) | 47(37.3) | 31(41.3) | 12.035 | 0.002 |
| During pregnancy | 114(56.7) | 78(61.9) | 36(48.0) | | |
| After pregnancy | 9(4.5) | 1(0.8) | 8(10.7) | | |
| Definition of EID | | | | | |
| HIV testing in infants | 184(91.5) | 119(94.4) | 65(86.7) | 4.444 | 0.108 |
| Taking off dried blood | 16(8.0) | 7(5.6) | 9(12.0) | | |
| I don't know | 1(0.5) | 0(0.0) | 1(1.3) | | |
| Benefits of EID | | | | | |
| Know HIV status | 86(42.8) | 46(36.5) | 40(53.3) | 11.810 | 0.003 |
| Access to ART | 112(55.7) | 80(63.5) | 32(42.7) | | |
| Get counseling | 3(1.5) | 0(0.00) | 3(4.0) | | |
| EID can detect HIV | | | | | |
| Yes | 195(97.0) | 125(99.2) | 70(93.3) | 5.600 | 0.018 |
| No | 6(3.0) | 1(0.8) | 5(6.70) | | |
| Appropriate EID age | | | | | |
| 6-8 weeks | 146(72.6) | 116(92.1) | 30(40.0) | 66.189 | <0.001 |
| 9 weeks-18 months | 36(17.9) | 9(7.1) | 27(36.0) | | |
| I don't know | 19(9.5) | 1(0.8) | 18(24.0) | | |
| HIV status | | | | | |
| Positive | 190(94.5) | 122(96.8) | 68(90.7) | 3.447 | 0.063 |
| Negative | 11(5.5) | 4(3.2) | 7(9.3) | | |
| Disclosure | | | | | |
| Yes | 135(67.2) | 90(71.4) | 45(60) | 2.784 | 0.095 |
| No | 66(32.8) | 36(28.6) | 30(40) | | |
| ART status | | | | | |
| Yes | 183(91.0) | 119(94.4) | 64(85.3) | 4.787 | <0.05 |
| No | 18(9.0) | 7(5.6) | 11(14.6) | | |

Attitudes:

The caregivers' attitudes and stigma towards EID was explored in this study. The factors significantly associated with uptake of EID services include:

Willingness to advice to a friend/relative to take their infants for EID ($\chi^2=55.74$; $p<0.018$); and ability to receiving EID test results ($\chi^2=22.297$; $p<0.001$). These factors are presented in table 4.

Table 4: Client/caregiver factors affecting uptake of early infant diagnosis services at Wakiso HCIV

Attitudes towards EID and Stigma

| Variable | N | Early uptake | Late uptake | χ^2 | p-value |
|-----------------------------|-----------|--------------|-------------|----------|---------|
| EID was done willingly | | | | | |
| Yes | 200(99.5) | 126(100) | 74(98.7) | 1.688 | 0.194 |
| No | 1(0.5) | 0(0.00) | 1(1.3) | | |
| Advice to friends/relatives | | | | | |
| Yes | 83(41.3) | 60(47.6) | 23(30.7) | 5.574 | 0.018 |
| No | 118(58.7) | 66(52.4) | 52(69.3) | | |
| Keep HIV status secret | | | | | |
| Yes | 127(63.2) | 76(60.3) | 51(68.0) | 1.194 | 0.550 |
| No | 71(35.3) | 48(38.1) | 23(30.7) | | |
| I don't know | 3(1.50) | 2(1.6) | 1(1.3) | | |
| Why not test | | | | | |
| Fear | 172(85.6) | 110(87.3) | 62(82.7) | 2.565 | 0.464 |
| No clear benefits | 9(4.5) | 5(4.0) | 4(5.3) | | |
| I did not know | 8(4.0) | 3(2.4) | 5(6.7) | | |
| Others | 12(6.0) | 8(6.3) | 4(5.3) | | |
| Received test results | | | | | |
| Yes | 177(88.1) | 120(95.2) | 57(76.0) | 22.297 | 0.001 |
| No | 24(12.0) | 6(4.8) | 18(24.0) | | |

Health facility factors affecting the uptake of early infant diagnosis services at Wakiso HCIV

This study revealed that waiting time at health facility before seeing a health worker ($\chi^2=4.270$; $p<0.039$); and availability of EID services ($\chi^2=6.063$; $p<0.014$) were significantly associated with uptake of early infant diagnosis services at Wakiso HCIV as indicated in table 5.

Table 5: Health facility factors affecting the uptake of early infant diagnosis services at Wakiso HCIV

| Variable | N | Early uptake | Late uptake | χ^2 | p-value |
|--------------------------------|-----------|--------------|-------------|----------|---------|
| Accessibility | | | | | |
| ≤5Km | 164(81.6) | 106(84.1) | 58(77.3) | 1.445 | 0.229 |
| 6-10Km | 37(18.4) | 20(15.9) | 17(22.7) | | |
| Pay for service | | | | | |
| Yes | 12(6.0) | 7(5.6) | 5(6.7) | 0.103 | 0.748 |
| No | 189(94.0) | 119(94.4) | 70(93.3) | | |
| Attitude | | | | | |
| Very good | 5(2.5) | 2(1.6) | 3(4.0) | 1.303 | 0.728 |
| Good | 147(73.1) | 94(74.6) | 53(70.7) | | |
| Neutral | 42(20.9) | 26(20.6) | 16(21.3) | | |
| Bad | 7(3.5) | 4(3.2) | 3(4.0) | | |
| Waiting time | | | | | |
| ≤1 hour | 36(17.9) | 28(22.2) | 8(10.7) | 4.270 | 0.039 |
| >1 hour | 165(82.1) | 98(77.8) | 67(89.3) | | |
| Availability of health workers | | | | | |
| Always available | 182(90.5) | 117(92.9) | 65(86.7) | 2.105 | 0.147 |
| Sometimes available | 19(9.5) | 9(7.1) | 10(13.3) | | |
| EID availability | | | | | |
| Always available | 180(89.6) | 118(93.7) | 62(82.7) | 6.063 | 0.014 |
| Sometimes available | 21(10.4) | 8(6.3) | 13(17.3) | | |

CHAPTER FIVE: DISCUSSION

Introduction

This chapter discusses the results of the study in relation to the study objectives and similar previous studies from which conclusions and recommendations are drawn.

Level of uptake of early infant diagnosis of HIV services at Wakiso HCIV, Wakiso district

In this study, there was moderate uptake of EID services at Wakiso HCIV. Of the caregivers that participated in the study, 62% of their HIV exposed infants had been tested for HIV within two months of age. This is lower than the MOH recommendation of at least 80% of infants born to HIV positive women receiving a virological HIV test by 2 months of age (Uganda National Plan for Elimination of Mother to child Transmission of HIV 2012). EID programme is generally new and at Wakiso HCIV, EID service provision started in 2009 with strengthening efforts enhanced in 2011. Coupled with knowledge gaps among caregivers regarding benefits, when to take an infant for EID and frequency of HIV testing in infants could explain the relatively low early uptake of EID services.

From this study, the uptake of EID services within eight weeks of age is low compared to the results from a prospective observational cohort study on diagnosing HIV infection among infants done in Academic hospital in Johannesburg, South Africa where the proportion of HIV exposed infants that had DNA-PCR done by six weeks of age was 85% (Lilian RR et al 2013). The study in Academic hospital had a higher uptake probably because it was a cohort study where mother-infant pairs were recruited at birth and actively followed up with higher likelihood of retention in care and access to EID services. The uptake of EID services within the recommended two months of age in this study is however, higher than the uptake in a descriptive observational

study conducted at the Arthur Davidson Children's Hospital in Zambia on Analysis of HIV Early Infant Diagnosis Data to Estimate Rates of Perinatal HIV Transmission, where (58.6%) of HIV exposed children had a PCR test done in recommended age (Torpey K et al, 2012). The difference in EID uptake could be that the study in Zambia used PMTCT data and DNA PCR results from the hospital records whose quality is affected data completeness and accuracy. It is also possible that the PMTCT program in Wakiso was better implemented than that in Arthur Children's hospital in Zambia.

The fact that 38% of all those HIV exposed infants had a DNA PCR done late poses a risk of late identification of HIV infected infants; and hence delayed enrollment into HIV care and late initiation on ART; with resultant high morbidity and mortality among these children.

Socio-demographic factors of caregivers associated with uptake of early infant diagnosis services

This study explored the effect of socio-demographic characteristics on the uptake of early infant diagnosis of HIV.

In this study; age of caregivers was significantly associated with uptake of EID services. The age of the caregiver has an influence on a number of factors that may affect the survival of the infant and their decision of seeking health care. According to UDHS 2006, Young mothers were found to attend more ANC, deliver from health units and attend PNC than older women especially those aged 35- 49 years. These are all avenues where information and services for DBS can be offered. Findings from this study are different from those of a retrospective cohort study conducted in Mozambique in the districts of Alto Molo´cue` and Namacurra on improving

retention in the EID program that revealed no significant association between EID and maternal age (Philip J et al, 2011). The difference could be that the study in Mozambique was conducted in two rural district hospitals with an environment different from Wakiso that is peri-urban and all HIV infected mothers at birth were offered enhanced EID referral that could have influenced uptake irrespective of age of caregiver.

In this study, being a mother as a caregiver was significantly associated with uptake of EID services. Babies whose caregivers are the mothers sought for EID services early compared to those whose caregivers are not their biological mothers. Babies whose caregivers were not their mothers were found to be lost to follow, did not bring children for EID services early instead children are diagnosed from YCC during immunization or in outpatient while sick.

Similar findings are reported in a cohort study done in Botswana about loss to follow up, late or no receipt of results and late initiation on antiretroviral therapy, for children whose caregivers are not biological mothers. (Greek T. 2008)

Findings from this study reveal that educational status of the caregiver was significantly associated with uptake of EID services. Caregivers with at least primary level education sought for early EID services for their infants more than those with no education. Education influences other health seeking behaviors that can be utilized to get HIV exposed infants tested. Examples of these are ANC, health facility delivery, PNC and seeking care from qualified health care providers. Also education can influence one's knowledge about DNA PCR testing services hence utilize them.

Similar findings were reported in a prospective study done at Queen Elizabeth Central Hospital Blantyre, Malawi on predictors and impact of losses to follow-up of infants born in a large cohort of delivering women in urban Malawi, where there was strong evidence that infants born to mothers of higher education status were more likely utilize EID services (Ioannidis et al, 1999).

In this study, occupation of the caregiver was significantly associated with uptake of EID services. Being a peasant farmer resulted into enhanced uptake of EID services early. Findings were reported in a prospective study done at Queen Elizabeth Central Hospital Blantyre, Malawi on predictors and impact of losses to follow-up of infants born in a large cohort of delivering women in urban Malawi also showed statistical significance between occupation of care giver and utilization of EID services. However, in the Malawi study there was strong evidence that infants born to mothers who were teachers were more likely to be lost to follow up and hence less likely to utilize EID services (Ioannidis et al, 1999). Occupation can act as an enabling factor for accessing DNA PCR HIV testing services like getting transport hence offering an opportunity for having HIV exposed infants get tested for HIV. But for some caregivers heavily engaged in occupation with busy schedules, this may affect negatively the update of EID services.

In this study, the family size and the parity of the caregiver showed a significant relationship with early utilization of EID services. The findings from this study are different from those of a retrospective cohort study conducted in Mozambique in the districts of Alto Molo´cue` and Namacurra on improving retention in the EID program where the predictors of EID were larger household size and unlike in this study where small family size of six or less members was a

predictor of EID (Philip J et al, 2011). In the Uganda context, family size influences availability of resources to seek for health services especially in urban and peri-urban settings like Wakiso. However, the study in Mozambique was conducted in a rural setting where a larger family size may lead to more manpower for agriculture engagement and hence more resources available.

Caregiver factors affecting uptake of early infant diagnosis services:

This study also assessed caregiver's factors in relation to the uptake of EID services. On bivariate analysis, a number of factors were significantly associated with early uptake of EID services.

In this study, caregiver's knowledge of age of child for EID was significantly associated with uptake of EID services. Findings from this study are similar to those in a cohort study conducted in rural Kenya to determine the uptake and drop out of HIV exposed infants where knowledge of EID was significantly associated with uptake of EID services (Hassan AS et. al 2011)

This study revealed that knowledge of the benefits of EID was significantly associated with uptake of EID services. Findings from this study are similar to those from a cohort study conducted in rural Kenya to determine the uptake and drop out of HIV exposed infants where majority of the caregivers were not sure of the frequency of EID and exact time; and this significantly affected uptake of EID services (Hassan AS et. al 2011).

In this study, there was a significant relationship between the caregivers who indicated that they had got knowledge about EID during pregnancy and uptake of EID services. This further emphasizes the importance of antenatal care and why all pregnant women should attend ANC.

These findings are similar to those from a cross-sectional study conducted in Kibaha and Bagamoyo districts in Coast region in Tanzania, involving all HIV-exposed infants aged between 4 weeks to 18 months born live to HIV-infected mothers; early HIV testing during pregnancy and knowledge of EID in pregnancy significantly predicted the testing among HIV-exposed infants (Gregory G.J 2012).

This study revealed that knowledge of the benefits of EID was significantly associated with uptake of EID services. Findings from this study are similar to those from a cohort study conducted in rural Kenya to determine the uptake and drop out of HIV exposed infants where majority of the caregivers were not sure of the benefits of EID and type of test to be done for EID; and this significantly affected uptake of EID services (Hassan AS et. al 2011).

In this study, knowledge of caregiver that EID can detect HIV in infants was significantly associated with uptake of early infant diagnosis of HIV services. Findings from this study are similar to those in a cohort study conducted in rural Kenya to determine the uptake and drop out of HIV exposed infants where knowledge of EID was significantly associated with uptake of EID services (Hassan AS et. al 2011)

In this study revealed a significant association between caregivers that were on antiretroviral therapy with increased uptake of EID services. These findings are similar to those from a cross-sectional study conducted in Kibaha and Bagamoyo districts in Coast region in Tanzania, involving all HIV-exposed infants aged between 4 weeks to 18 months born live to HIV-infected mothers; where enrollment of HIV positive caregivers into care and treatment predicted significantly the testing among HIV-exposed infants (Gregory G.J 2012). Another retrospective cohort study done by Cook RE et al 2011 on predictors of successful EID in a rural district hospital in Zambézia, Mozambique, showed that receipt of ART by the mother of the HIV exposed infant increased the likelihood of uptake of EID services. HIV infected caregivers on ART have better health outcomes and tend to live healthier lives than those not on ART; and hence more likely to seek for health care for their own and children.

Relationship between caregivers' attitudes and stigma; and uptake of EID services

The caregivers' attitudes and stigma towards EID was explored in this study. The factors significantly associated with uptake of EID services include:

HIV exposed infants of caregivers who reported that they would advise their friends/relatives to take a child suspected to be born to an HIV infected mother for EID significantly utilized EID services early.

In this study, there was a significant relationship between caregivers who indicated that they had tested the baby and had received their HIV test result with uptake of EID services within the MOH recommended age of DNA PCR testing.

Health facility factors affecting the uptake of early infant diagnosis services

From this study, there are health facility factors associated with uptake of early infant diagnosis of HIV.

This study revealed that waiting time at health facility before seeing a health worker was significantly associated with uptake of EID services. Seeing a health worker within 2 hour improves patients seeking EID services and patients' retention in the EID clinic according to WHO 2010 Recommendations for PMTCT.

In this study, it was revealed that the availability of EID services at health facility was significantly associated with uptake of early infant diagnosis services. When EID services are available; children receive EID services early, thus early prevention of HIV or early initiation of ART. A cross-section study done in south-south region of Nigeria revealed that in situations where majority of HIV positive women breast-fed without EID services, new infections occurred throughout breastfeeding period. (Piwoz et al, 2005).

Methodological issues

1. Information bias: inability of participants to remember certain events.
2. Selection bias: Participants were selected using non-probability method. This might have affected the internal validity of results.
3. The other major limitation was that the researcher was unable to capture women that had not brought their infants for testing at all and most of those that had not delivered in health facilities. This was because the study was facility-based and these women were in communities. This has limited the generalizability of study results.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the researcher`s final conclusions and recommendations based on the findings and discussions of the study.

Conclusions

Uptake of EID services at Wakiso HICV is lower than the recommended MOH target of 80% HIV exposed infants accessing early infant diagnosis of HIV services by two months of age.

A number of socio-demographic factors are associated with early uptake of EID services. These include: age of caregivers, type of caregiver, educational status of caregivers, family size and parity of caregivers.

The caregiver factors that are associated with uptake of EID services at Wakiso HCIV include Caregivers` knowledge of appropriate age of child for EID, knowledge of frequency of EID, knowledge of benefits of EID and knowledge that EID can detect HIV

Maternal receipt of antiretroviral therapy is associated with HIV testing among HIV exposed infants.

The health facility factors that are associated with early utilization of EID services include waiting time and constant availability of EID services.

Recommendations

Recommendations have been drawn basing on the findings of this study. These include:

1. Wakiso district education department should continue to advocate and improve the education of the girl child in order to increase access to information.
2. There is need for the District Health Team (DHT) and health workers at Wakiso HCIV to create awareness among communities on the availability and benefits of early infant testing services, stressing the correct age when to bring HIV exposed infants for testing.
3. Strengthening option B + implementation in MCH to ensure that all HIV positive pregnant women identified are enrolled on antiretroviral therapy; and minimize missed opportunities for ART initiation.
4. Strengthening health education during antenatal care visits and general MCH to ensure that topics related to HIV testing in infants are well-articulated focusing on benefits of EID, appropriate age recommended by MOH for DNA-PCR testing and need for early identification and ART initiation of HIV positive infants.
5. A qualitative study needs to be carried out to explore the communities' barriers to uptake and utilization of DNA PCR testing of HIV exposed infants in Wakiso district.

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APPENDENCES

Appendix I. Consent form for study participants

Good morning/afternoon Sir/madam,

I am called; a member of a team from International Health Sciences University working in collaboration with Wakiso District, Health Department. We are conducting a study to assess the uptake of Early Infant Diagnosis of HIV services and identify factors influencing utilization of these services at Wakiso HCIV. The information is being sought from their mothers or caregivers. Up to 174 mothers or caregivers will be interviewed and your information will be combined with theirs to give a complete picture.

The information generated will be used to inform the health workers at this facility and the District Health authorities to develop strategies for improving uptake of these services. This will help to reduce on the morbidity and mortality associated with early childhood HIV/AIDS in un-diagnosed infants and prevent possible postnatal HIV acquisition in those found to be negative.

Your participation in this study is entirely voluntary and you are free to withdraw from this study at any time without penalty. You are also free to ask questions about this study.

We are kindly requesting you to participate in this study. Do you accept to participate in this study? Yes [] No []. If yes,

Signature or left thumb print of the interviewee.....

Name of the Interviewer.....

Telephone contact_____

Date.....

Appendix II: A copy of Questionnaire for study Participants (Mothers or caregivers) of HIV exposed infants

QUESTIONNAIRE NO.....

DATE OF INTERVIEW.....

A. GENERAL INFORMATION

1. Age of the infant..... (Must be between six weeks and 18 months at the time of study).

2. Sex of the child 1= Male 2= Female []

3. Relationship of next of kin to HEI

1= Mother 2=Father 3=Guardian (specify..... []

B. Uptake of EID services

4. Did your infant receive HIV testing?

1= Yes 2= NO

5. Date of testing for HIV

6. Date of birth of infant.....

7. Uptake status

1= Early 2= Late []

C. Socio-demographic factors of client/care givers:

8. Type of respondent

1= Mother 2= other caregiver []

9. Sex of caregiver 1= Male 2= Female []

10. How old are you now?

11. Education level of care-giver.

1= none 2= Primary 3=Secondary 4=Tertiary []

12. Occupation

1= Peasant farmer 2= Business person 3= Civil/ Public Service (salary earner) 4=
Housewife/ Student 5= Others (Specify)..... []

13. Marital status.

1= Single 2= Married 3= Separated/Divorced 4=widowed []

Family/household size

14. How many children do you have?

1. ≤ 4 children 2. More than 4 children []

15. How many members are in your family?

1. ≤ 6 members 2. More than 6 members []

Monthly income

16. What is your monthly income?

1 = Less than or equal to (\leq) 200,000 2 = Greater than ($>$) 200,000 []

D. Individual factors of the client/care giver

Knowledge about the importance of DNA PCR HIV testing

17. Have you ever heard about the test used to test for HIV; the AIDS causing agent in infants born to HIV positive mothers?

1= Yes 2= No

18. If yes, at what age is the testing done?

1= Correct age mentioned 2= Mentioned wrong age []

19. If yes, how many times is the test done?

1= Once 2 = More than once []

20. If yes, from where did you get the information?

1= Health workers 2= Mass media 3= Others (specify.....) []

21. When did you hear about HIV testing in infants?

1= Before pregnancy 2= During delivery 3=After delivery []

22. What makes you to test your baby?

1=Counseling from HCWs 2= Eager to know results 3= Others (specify).....[]

23. What is early infant diagnosis of HIV?

1= Virological HIV testing in infants/child 2= Taking off dried blood spot sample from child
3= I don't know 4= Others specify[]

24. What is the benefit of EID?

1= Know status of your child early 2= Timely access to ART if found HIV positive
3= Allows continued adoption of HIV preventive measures 4= Get additional counseling from health workers
5= I don't know 6= Others specify []

25. Can EID detect HIV before a child develops AIDS?

1= Yes 2= No []

26. What age is appropriate for first EID (1st DBS sample collection)?

1= Between 6 to 8 weeks 2= Between 8 weeks and 18 months 3= Over 18 months
4= I don't know []

Caregiver HIV status

27. Do you know your HIV status?

1= Yes 2= No []

28. If yes, what is your HIV status?

1= Positive 2= Negative []

29. When did you get to know that you're HIV infected?

1= Before pregnancy 2= During pregnancy 3= After pregnancy []

30. If HIV positive, have you ever disclosed your HIV status to a close friend or relative?

1= Yes 2= No []

31. If HIV positive, are you enrolled in HIV care at any facility?

1= Yes 2= No []

32. If yes, are you on antiretroviral therapy?

1= Yes 2= No []

Attitudes and perceptions about DNA PCR HIV testing

33. Did you bring this child for EID care services to this facility willingly?

1= Yes 2= No []

34. Would you want to know the HIV test results of your child?

1= Yes 2= No []

35. Would you advice a neighbor or relative to bring a child suspected to be born to an HIV positive mother for EID services

1 =Yes 2= No []

Fear/stigma

36. If your child underwent an HIV test and found to be positive, would you want it to remain a secret or not?

1= Yes, remain a secret 2= Not to remain a secret 3= don't know/ Not sure/ depends
[]

37. What would make you not to test your baby?

1= Fear 2= No clear benefits to the child 3= I did not know about the test
4= Others (specify)..... []

38. Have you received the HIV test result of the baby if he/she is tested?

1= Yes. 2= NO. [] If YES go question number 33

39. What is the HIV test results of your child?

1. Positive 2=Negative 3= I do not know []

40. Why have you not received HIV test results for your baby?

1. Fear 2= Results delayed in previous visits 3= Long distance 4=Other
(specify)..... []

E. Health facility/access factors.

41. Is there a health facility in your Sub County that offers HIV testing for HIV exposed infants?

1= Yes 2= No []

42. What is the nearest distance from your home to the nearest health facility where you can access health care services?

1= About 5 KM [] 2. 6-10 km 3= Over 10km []

43. Do you have to pay for the health care services you receive at the health facility?

1= Yes 2= No []

44. How would you rate the attitude of health workers in this health facility on a scale of 1 to 5?

1= Very good 2=Good 3= Neutral 4= Bad 5 =Very bad []

45. Whenever you come for EID services in this facility; for how long does it take to see a health worker?

1= 1 hour or less 2. More than 1 hour []

46. Are the health workers available whenever you come to the health facility?

1= Always available 2= Sometimes available 3=Never available []

47. Are EID services available whenever you come to the health facility?

1= Always available 2= Sometimes available 3=Not available []

Thank you for your time and Participation

Appendix III: Introduction Letter - IHSU



Office of the Dean, School of Nursing

Kampala, On the 14th day of July, 2014

TO WHOM IT MAY CONCERN

Re: Assistance for Research

Greetings from International Health Sciences University.

This is to introduce to you **Natukunda Janet** Reg. No. **2011-BNS-TU-019**, who is a student of this University. As part of the requirements for the award of a Bachelor of Nursing Sciences of this University, the student is required to carry out field research for the submission of a Research Project.

Janet would like to carry out research on issues related to: **Uptake of early infant diagnosis of HIV services and its associated factors at Wakiso Health Center IV, Wakiso District**

I therefore request you to render her such assistance as may be necessary for her research.

I, and indeed the entire University are thanking you in anticipation for the assistance you will render to her.

Sincerely Yours,

International Health Sciences
University
44 JUL 2014
SCHOOL OF NURSING
MRS. WAFULA EKIZABETH

DEAN

MAKING A DIFFERENCE IN HEALTH CARE

International Health Sciences University
P.O. Box 7782 Kampala | Uganda | East Africa
Tel: (+256) 0312 307 400 | E-mail: vc@ihsu.ac.ug | web: www.ihsu.ac.ug

Appendix IV: Letter of correspondence

Tel.

IN ANY CORRESPONDENCE
THIS SUBJECT PLEASE QUOTE

Ref. MED 218/07/2014



THE REPUBLIC OF UGANDA

Office of the District
Health Officer

P.O. BOX 7218
KAMPALA

Date: 18TH July, 2014

WAKISO DISTRICT COUNCIL

The In charge:
Wakiso Health Centre 1V

SUBJECT: RESEARCH ASSISTANCE FOR MS. NATUKUNDA JANET

I write to introduce to you the above named person, a student from International Health Sciences University who has asked for permission to carry out research at your health facility on issues related to: **uptake of early infant diagnosis of HIV services and its associated factors at Wakiso health centre 1V, Wakiso District.**

I have no objection to that effect; therefore you are requested to accord her any necessary assistance.

She is required to submit to us a copy of the report findings.

Thank you.

A handwritten signature in blue ink, appearing to read 'Kagwire Robert'.

Kagwire Robert
FOR: DISTRICT HEALTH OFFICER

c.c. Secretary for Health L C V
c.c. Chief Administrative Officer .
c.c. Ms. Natukunda Janet.