

**ASSESSING THE INFLUENCE OF HEALTH FACILITY
FACTORS ON UTILISATION OF EARLY INFANT DIAGNOSIS
FOR HIV INFECTION IN KILOLO DISTRICT COUNCIL**

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FACTORS ON UTILISATION OF EARLY INFANT DIAGNOSIS
FOR HIV INFECTION IN KILOLO DISTRICT COUNCIL**

By

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**A Dissertation Submitted to the School of Public Administration and
Management in Partial Fulfilment of the Requirements for the Degree of
Master of Science in Health Monitoring and Evaluation (HME) of Mzumbe
University**

2016

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by Mzumbe University, a dissertation entitled “Assessing *the Influence of Health Facility Factors on Utilisation of Early Infant Diagnosis for HIV Infection in Kilolo District Council*” in fulfilment of the requirements for award of the degree of Masters of Science in Health Monitoring and Evaluation (HME).

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DECLARATION

I, **Wilfred William Rwechungura**, declare that this dissertation is my own original work and that it has not been presented to any other institute or university for a similar or any other degree award.

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DEDICATION

This dissertation is dedicated to God, the Creator of Heaven and Earth and to my beloved parents Mr and Mrs. William Rwechungura.

ACKNOWLEDGEMENT

I extend my fervent gratitude to my supervisor Doctor Aggrey Raphael Kihombo for assisting me in preparing and writing my dissertation. Secondly, I am grateful to my classmates for providing me with assistance that made my work more professional.

Similarly, I owe innumerable thanks to the authorities of the selected health facilities in Kilolo District Council for linking me to mothers / guardians of HIV exposed infants and children and for linking me to healthcare workers dealing with Prevention of Mother to Child HIV Transmission (PMTCT), Reproductive and Child Health (RCH) Care and Early Infant Diagnosis (EID) services. The answers collected from the mentioned respondents who were entirely involved in EID services at health facilities, assisted me in arriving at research results and appropriate recommendations.

In addition, I am very grateful to my colleagues working in the health monitoring and evaluation sector for providing me with techniques of analysing data. I am also very grateful to my wife Jane Kigosi and my children Adventina Wilfred and Theodosia Wilfred for tolerating my absence at home during busy times in order to meet deadlines for course work and research activities.

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	- Acquired Immunodeficiency Syndrome
ANC	- Antenatal Clinic
ART	- Antiretroviral Therapy
ARV	- Antiretroviral
CTC	- Care and Treatment Centre
DBS	- Dried Blood Spot
DNA	- Deoxyribonucleic Acid
EGPAF	- Elizabeth Glaser Pediatric AIDS Foundation
EID	- Early Infant Diagnosis
HCW	- Healthcare Worker
HEI	- HIV-Exposed Infant
HIV	- Human Immunodeficiency Virus
HSSP	- Health Sector Strategic Plan
MTCT	- Mother to Child Transmission
PCR	- Polymerase Chain Reaction
PEPFAR	- President Emergency Plan for AIDS Relief
PLWHA	- People living with HIV/AIDS
PMTCT	- Prevention of Mother to Child HIV Transmission
RCH	- Reproductive and Child's Health
RMNCH	- Reproductive, Maternal, New born, Child Health
TACAIDS	- Tanzania Commission for HIV/AIDS
THMIS	- Tanzania HIV and Malaria Indicator Survey
UNAIDS	- United Nations and AIDS
UNGASS	- United Nation General Assembly
UNICEF	- United Nation Children's Funds
WHO	- World Health Organisation

ABSTRACT

This study, which involved a sample of 200 respondents, was conducted in Kilolo District Council in Tanzania to assess the influence of health facility factors on utilisation of Early Infant Diagnosis of HIV infection (EID) services. The study problem was that there are HIV exposed infants who are enrolled in the EID programme but they don't access the intended services and hence the need for conducting the study. The specific objectives were (i) to evaluate availability of EID materials and its influence on utilisation of EID services in Kilolo health facilities; (ii) to assess availability of sample and results transportation system and its influence on utilisation of EID services in Kilolo health facilities; (iii) to assess the competence of healthcare workers and its influence on utilisation of EID services at Kilolo health facilities; and (iv) to assess the satisfaction of mothers / guardians of HIV exposed infants on EID services provided in Kilolo health facilities.

The study findings revealed that utilisation of EID service was indeed low (at 38%) as data suggested. Among contributing factors was inadequate EID materials at health facilities. Forty eight percent (48%) of the health worker respondents strongly disagree that there are adequate DBS materials at health facilities. On the same issue, when health workers were asked on whether they experienced stock outs of EID materials, fifty seven percent (57%) answered in the affirmative. The other finding was that health facility care workers do not have sufficient skills for providing EID services. Forty three percent (43%) of the healthcare worker respondents reported that the sample and results transportation system is not reliable. The results showed that availability of EID materials and sample and results transportation system positively influences utilisation of EID services at the health facilities whereas competence of healthcare workers influences negatively the utilisation of EID services.

This study recommends that the healthcare workers be trained in providing EID services and that arrangements be done for ensuring availability of EID materials, sample and results transportation system and availability of competent healthcare workers.

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CHAPTER ONE

BACKGROUND AND PROBLEM STATEMENT

1.1 Background Information

For the past decade to date several evaluation studies on health services related with HIV infection have been conducted worldwide and Tanzania in particular as a way of advocating means to reduce or terminate HIV related morbidity and mortalities among children (Gamaliel,2012). Globally, an estimated 35.5 (32.2 – 38.8) million people were living with HIV in 2012, an increase from previous years as more people are receiving the life-saving antiretroviral therapy (UNAIDS,2013). From the same source, it was indicated that there were 2.3 (1.9-2.7) million new infections globally, being a 33% decline in the number of new infections from 3.4 (3.1-3.7) million in 2001. The same source revealed that, although the number of AIDS death declined to 1.6(1.4-1.9) million AIDS deaths in 2012, down from 2.3(2.1-2.6) million in 2005, over 1 million children were living with HIV, contracted predominantly through infection from their mothers during this period of time. Majority of these women and children are in the developing world with two thirds of the infected adults and over 90% of the world's children being in Africa (UNAIDS, 2013).

The Sub – Saharan Africa (SSA) is highly affected by HIV with an estimated 22.5 million people living with HIV/AIDS, representing 68% of global HIV and AIDS burden (UNAIDS 2010). Women and girls in this region are excessively affected by HIV/AIDS with an estimated 12 million, accounting for 76% of all women with HIV and AIDS globally (UNAIDS, 2010).

Transmission of HIV can occur through contact with body fluids; the relatively cellular body fluids such as blood, semen, vaginal secretions, and breast milk are more effective in transmitting the virus than fluids deficient in cells such as saliva, urine, and tears (Hassan *et al.*, 2012). Likewise, transmission may occur across mucous membranes or broken skin during sexual intercourse (both heterosexual and homosexual), but it also may occur via intravenous exposure such as sharing infected needles with intravenous drug users, occupational exposure in the healthcare environment, or treatment with infected blood products (Gayle & Hill, 2001).Now that

donated blood is routinely screened for HIV via this route has been reduced significantly (Hassan *et al.*, 2012).

HIV infection in pregnancy has become the most common complication of pregnancy in some developing countries. This has major implications for the management of pregnancy and birth. More than 70% of infections are a result of heterosexual transmission and over 90% of infections in children results from mother- to- child- transmission (MTCT). Most of the transmission is thought to occur in late pregnancy and during birth (Obuekwe, 1999). With an estimated 1.5 million HIV – positive women becoming pregnant each year, almost 600,000 children will be infected by mother to child transmission annually, over 1600 each day (Gayle & Hill, 2001).

Different parts of the country are disproportionately affected. The prevalence of HIV infection ranges 1.5% in Manyara region to 14.8% in Njombe region. (THMIS 2011-12). Factors that have driven the epidemic include low and inconsistent use of condoms; multiple sex partners; mobility; transactional sex; cross – generational sex; poor quality of transfused blood; lack of male circumcision; mother-to-child transmission; gender inequalities accompanied with poverty, and most- at – risk populations (TACAIDS, 2009). The same source also indicated that the proportion of pregnant women who access PMTCT services has grown from almost none at the pilot of PMTCT services in 2000 to 61% in 2008, and the access to antiretroviral (ARV) medication continue to grow nationwide.

It was approximated that, 123,800 HIV- positive women deliver HIV – exposed infants annually in Tanzania (HSSP, 2008 -2012). Assuming a 35% transmission rate without intervention, an estimated 43,300 children will become infected with HIV each year. Up to 50% of HIV positive babies will die before their 2nd birthday if not provided appropriate care and treatment. In the face of this scourge, several mitigating efforts have been put in place in the country and worldwide generally; among these include improved maternal services.

Maternity services in areas of high HIV prevalence have several responsibilities as follows: firstly, to enable women to be tested and to use these results to maintain their health in an optimal manner; secondly, to utilise appropriate interventions to reduce the rate of mother to child transmission of HIV (PMTCT); and thirdly, to train staff

and provide equipment to prevent nosocomial transmission of HIV (HSSP, 2008 – 2012).

One of the strategies adopted by the Tanzania government to fight HIV/AIDS is the prevention of mother-to-child transmission of HIV. There are four elements to the comprehensive approach of prevention of mother-to-child transmission of HIV that include: primary prevention of HIV among women of child bearing age and their partners; prevention of unintended pregnancies among women infected with HIV; Prevention of HIV transmission from mother to infants and provision of treatment, care and support to be given to women infected with HIV and their partners, infants and families.

In addition to what was mentioned previously, early diagnosis of HIV infection is essential for ensuring timely initiation of ART and reducing the high morbidity and mortality that occurs among HIV-infected children who do not receive treatment. It is estimated that without treatment, net survival at one year would be 52% among infants infected prenatally (with 20% having demised by 90 days) and 78% among infants infected during breastfeeding (WHO report, 2010).

The same source stated that, infants known to have exposed to the Human Immunodeficiency Virus (HIV) should undergo a biological test for infection at 4 to 6 weeks of age. Antiretroviral therapy (ART) should be initiated upon diagnosis of HIV infection in children aged less than 24 months. However, implementing programmes for such early infant diagnosis and treatment has proved challenging.

1.2 PMTCT and EID programme in Kilolo District Council

The PMTCT programme in Tanzania targets pregnant women and those of reproductive age as well as their sexual partners, children, families and communities. The goals of the programme are to: reduce MTCT of HIV and to improve care for infected parents and children by scaling up PMTCT comprehensive services within all Reproductive and Child Health Facilities. Indeed, the programme aims to prevent HIV infection in children, giving babies the chance to be HIV free and to provide women and their families with access to HIV prevention, testing, care, treatment and support. PMTCT is the core component of the National Health Sector Strategy on HIV/AIDS

(2008 -2012) that has two main strategic objectives: firstly, to reduce MTCT during pregnancy, delivery and breastfeeding, while also ensuring the entry of HIV - infected women and their families into care and treatment; and secondly, to increase the percentage of HIV – infected women who receive antiretroviral prophylaxis from 32% in 2007 to 80% in 2012.

PMTCT programme started in the district in the year 2007 where only six health facilities were offering such services (OPTION A+). In 2009 a total of 40 health facilities were offering PMTCT services including EID for HIV infection. In 2012, eleven health facilities started to offer OPTION B+. By the year 2013 all 49 health facilities providing RCH services were offering OPTION B+.

How the programme works is that blood samples are collected from exposed infants and placed on filter papers (DBS) in all 49 health facilities seven days of a week. The sample is collected to an exposed infant who is between 4weeks old and 6 weeks old of age. Samples are then dried and placed in individual envelopes and then placed in a larger bag for transportation to Iringa Regional Hospital. From Iringa Regional Hospital samples are sent to Mbeya Referral Hospital ($\approx$ 350 km) where they are analysed and results are sent back to Iringa Regional Hospital via buses or emails. The respective HCWs collect results from the Regional Hospital. The turnaround time is reported to be 4 weeks or above (total time used since the sample was sent up to the receipt of the results). Another test is done when a baby is 18 months and this is done by using the routine rapid antibody antigen tests.

Exposed infants are initiated Niverapine syrup soon after birth up to six weeks of age and also they are initiated cotrimoxazole syrup from the 4th week post-delivery up to 18 months when they undertake confirmatory test and proven HIV negative. HIV positive babies are referred to CTC for further management and care.

In implementing this programme, the council is collaborating with TUNAJALI II. TUNAJALI II is among the DELOIT funded projects supporting PMTCT programmes in district councils in Iringa region and other regions in the country. TUNAJALI II is supporting the council by providing trainings on PMTCT (OPTION B +), supportive supervision, coaching and mentoring. They also provide data collecting tools and support the cost of transporting DBS samples to and from Iringa regional hospital.

Table 1.1 shows the health facilities providing EID services and number of exposed babies receiving PCR test for HIV diagnosis in Kilolo District Council from the year 2010 to 2014.

Table 1:1 EID Services in Kilolo District Council from 2010 - 2014

Year	≠ of HF's	≠ of exposed babies	Infants initiated CTX	Infants initiated ARV after birth	Infants receiving PCR test	HIV +	HIV -	Referred to CTC
2010	40	220	147	176	182	20	162	20
2011	44	410	320	281	194	11	183	11
2012	46	361	164	313	220	8	212	8
2013	49	294	276	291	206	14	192	14
2014	49	389	369	334	307	10	297	10

1.3 Statement of the problem

It is estimated that there are more than 1.7 million births annually and 8.2% HIV prevalence at antenatal clinics (ANC) in Tanzania. Data reveal that approximately, 123,800 HIV-positive women deliver HIV-exposed infants (HEI) annually in Tanzania (HSSP, 2008 - 2012). Assuming a 35% transmission rate without intervention, an estimated number of 43,300 children will become infected with HIV each year (Rajendra *et al.*, 2014). Up to 50% of HIV positive babies will die before their 2nd birth day if not provided appropriate care and treatment (Jones, Sherman & Varga, 2005).

In relation to the above data on the trend of HIV worldwide, previous studies in Tanzania have evaluated several health facility factors affecting the effectiveness of Early Infant Diagnosis (EID) of HIV Infection in which the main focus has been on the elaboration of the health facility factors and the challenges they encounter in the implementation of EID programme in various Tanzanian regional contexts (Kisika, 2015 and Gamaliel, 2012). However, similar studies have not been conducted in Kilolo District Council and likewise it is not certain whether the same health facility challenges face Kilolo District Council in the implementation of EID services.

Unlike previous studies carried out in Tanzania and elsewhere, this study assesses the influence of health facility factors on utilisation of EID programme in Tanzania. This is done by assessing the influence of the three independent variables (availability of competent healthcare workers, EID materials and reliable sample and results transportation system) on the dependent variable (that is utilisation of Early Infant Diagnosis for HIV infection) and by basing on status of EID services at health facilities in Kilolo District Council as observed by the author and as reported by clients (mothers/guardians of HIV exposed infants) and healthcare workers.

This study was conducted due to the fact that early diagnosis of HIV infection is essential for ensuring timely initiation of Antiretroviral Therapy (ART) and reducing the high morbidity and mortality that occurs among HIV-infected children who do not receive treatment. Hence, identification of HIV Exposed Infants (HEI) and linking them to Deoxyribonucleic Acid (DNA) Polymerase Chain Reaction (PCR) testing, follow up for results, and final HIV status determination will ensure proper utilisation of (Early Infant Diagnosis) EID for HIV to many HIV exposed infants and hence will reduce morbidity and mortality associated with HIV/AIDs among children.

In Tanzania, despite the availability of early HIV testing in infants and young children and high coverage of immunisation programme, utilisation of early infant diagnosis of HIV infection has been facing a number of challenges leading to improper utilisation of EID for HIV. Iringa is the second leading region for HIV prevalence in the country with prevalence of 9.1%. Kilolo District Council as one of the councils in Iringa region is also mostly affected with HIV/AIDs with prevalence of 9.1 % (THMIS, 2012).

Numbers of PLHIV cases recorded in Iringa region from 2011 – 2013 were 5800, 7070, and 7532 respectively. HIV prevalence among pregnant women (PMTCT) reported from 2011 – 2014 was 11%, 6.1%, 5.6% and 7.5% respectively. Despite high prevalence of HIV among pregnant women the implementation and utilisation of EID services in the region generally is not optimal as indicated with the following data from Tanzania RMNCH scorecard.

The percentage of infants receiving PCR test in the region is 58 % (Tanzania RMNCH scorecard April -June 2014). Percentages of infants receiving PCR test for Kilolo district council were 13%, 79% and 24% (Tanzania Iringa RMNCH scorecard Q1, _Q2, Q3/2014). The data above doesn't show a good positive trend. Furthermore, the Kilolo District Council Annual RCH Report of 2014 showed that 392 HIV exposed infants were born from HIV positive mothers but only 164 exposed babies (42%) received PCR test within the first two months of their lives. Hence, all such circumstances necessitate conducting the study to assess the influence of health facility factors on Early Infant Diagnosis (EID) programme in Kilolo District Council.

1.4 Evaluation Questions

1.4.1 Main Evaluation Question

What is the influence of health facility factors (i.e. availability of EID materials, reliable sample and results transportation system, competent healthcare workers) on the utilisation of EID services in Kilolo District Council?

1.4.2 Specific Evaluation Questions

- i. What is the extent of the availability of EID materials and their influence on utilisation of EID services at Kilolo health facilities?
- ii. What is the extent of availability of sample and result transportation system and its influence on utilisation of EID services at Kilolo health facilities?
- iii. To what extent are healthcare workers competent in carrying out EID services and their influence on utilisation of EID services at Kilolo health facilities?
- iv. To what extent are mothers / guardians of HIV exposed infants satisfied with EID services provided in Kilolo health facilities?

1.5 Evaluation Objectives

1.5.1 General Objective

To assess the influence of health facility factors (i.e. Availability of competent healthcare workers, EID materials and reliable sample and results transportation system) on utilisation of early infant diagnosis of HIV infection.

1.5.2 Specific Objectives

- i. To evaluate availability of EID materials and its influence on utilisation of EID services in Kilolo health facilities
- ii. To assess availability of sample and results transportation system and its influence on utilisation of EID services in Kilolo health facilities
- iii. To assess the competence of healthcare workers and its influence on utilisation of EID services at Kilolo health facilities
- iv. To assess the satisfaction of mothers / guardians of HIV exposed infants on EID services provided in Kilolo health facilities

1.6 Significance of the Evaluation

HIV/AIDS morbidity and mortality is one of the major health problems in Kilolo district council. Prevalence of HIV is 9.1%. Due to various socio economic factors women and children are more prone to suffer the consequences compared to other groups. Various interventions are in place to combat the pandemic including PMTCT and EID for HIV infection. Regardless the availability of the mentioned interventions in the district, still the data showed that the utilisation of EID for HIV infection is not optimal. Some studies in other parts of the world and Africa revealed some challenges associated with utilisation of the intervention and more need to be explored. This project therefore was conducted in the context of the District council to assess to what extent health facility factors affects utilisation of EID for HIV infection.

This study is quite relevant and significant due to the fact that the findings / results established will be used as inputs to the improvement of policies and guidelines regarding implementation of the EID services in Tanzanian health facilities. The findings will be shared with the District council health department, stakeholders and all the implementers including Healthcare Workers (HCWs) at the facility level for the better understanding of the gaps identified in the study and implementing the recommended strategies to improve EID programmes at the health facilities. Hence, the findings will be used for planning, decision making, resources allocation at all levels and re-orientation of the EID programme.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Literature Review

This section provides an overview of Early Infant Diagnosis and expounds various concepts associated with Early Infant Diagnosis. It also explains the theories related to Early Infant Diagnosis. The aim is to present the general profile of the problem as well as its historical background at a global level and in the Tanzanian context.

2.1.1 Mother to Child Transmission of HIV (MTCT)

An estimated 2.5 million children worldwide were living with HIV by the end of 2009, mostly had acquired through vertical transmission, and more than 90% of these children are in sub – Saharan region of Africa (Tejiokem *et al.*, 2011). PMTCT of HIV is a strategy that has been found to reduce MTCT to 4% or less in many areas of the world (UNAIDS, 2004). PMTCT services in Tanzania started in year 2000; its implementation is currently guided by the National PMTCT and paediatrics scale up plan (2009 -2013) which aims to increase HIV positive women who take any form of ART from 34% in 2007 to 80% by 2012 (UNGASS/TACAIDS, 2010). Eliminating the mother to child transmission of HIV will reduce exposure of infants to HIV and hence reduce the infant related HIV morbidity and mortalities. Parents especially mothers need to be aware and educated on the relevance of the prevention of mother to child HIV transmission and the importance of mother – child pair treatment at the health facilities. Thus, PMTCT provides HIV counseling and testing in pregnant women, ARV prophylaxis, infant feeding counselling, and comprehensive treatment of HIV – infected women and their families including follow up of infants for HIV testing at 4 – 6 weeks after delivery using virology tests. In this regard healthcare providers are advised to remind mothers/guardians to follow up the test result for their infants and children so that they can be advised accordingly on the appropriate drugs for taking in order to treat their HIV positive infants or for protecting their infants against HIV.

Implementation of PMTCT services in resource – constrained countries including Tanzania has been facing some potential bottlenecks, which are not limited to shortage of human resource for health sector but also hindering the rollout services to many sites as well as provision of high quality PMTCT services. The services provided are not always family centred as reproductive and child health services are not male friendly because immunisation and HIV EID services are offered differently thus leading to an increased loss to follow up (HDT/CEPA Report, September 2009).

2.1.2 Early Virological Diagnosis of HIV Infection in Infants and Children

As far as EID services are concerned, it is appropriate to be aware with advantages of the early virological diagnosis (EVD) of HIV infection in infants and children. EVD of HIV infection in infants and children has a number of advantages including the ones mentioned below:

- i. Enables the early identification of who have HIV-infection, as a first step in securing their treatment and care;
- ii. Enables the identification of those who are HIV – exposed but uninfected, facilitating follow – up care and prevention measures that will help to ensure that they remain uninfected;
- iii. Assist in the effective use of essential resources by targeting ART on children who need treatment;
- iv. Improve the psychosocial well – being of families and children, reducing potential stigma, discrimination and psychological distress for HIV – uninfected children and increasing the chances of adoption for orphans;
- v. Facilitates life – planning for parents and/or children who have HIV

2.1.3 Early Infant Diagnosis (EID) Technologies

A number of technologies are involved in performing Early Infant Diagnosis of HIV infection. Such technologies include:

- i) HIV DNA PCR is the most widely used initial assay for early infant diagnosis in industrialized countries

- ii) HIV RNA PCR and other nucleic acid detection techniques have also proved accurate and reliable, and they provide additional information about virological status that can assist in clinical management
- iii) Both HIV DNA and HIV RNA technologies are becoming less expensive, more automated and faster in producing results
- iv) Ultrasensitive p24 antigen detection is a reliable method for detection of HIV infection in infants aged over 6 weeks but the required equipment and consumables are not yet available for purchase in ways suitable for use in achieving national programme coverage.

As resource – limited settings are increasingly able to purchase HIV DNA and HIV RNA kits and equipment, their choice of technology should be guided by potential public health benefits. The following additional factors should also be considered:

- i) New purchase of required equipment;
- ii) Commercial availability and cost of equipment and reagents;
- iii) Projected numbers of tests required from geographical areas;
- iv) Projected number of samples required to be processed (sample throughput)

2.1.4 Theory for Measuring Utilisation of the EID Services

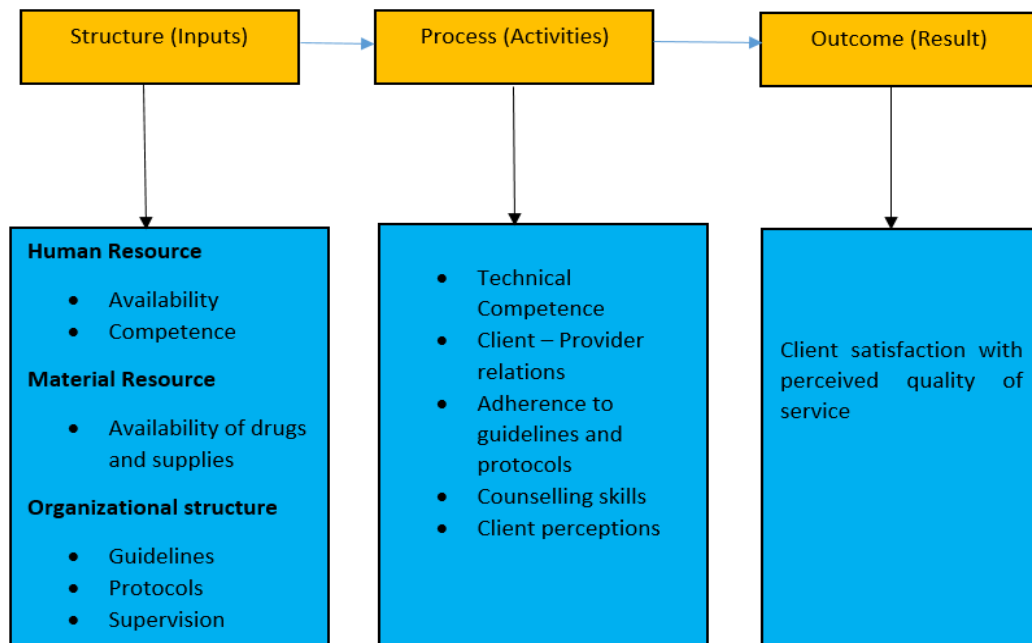
With this study what is required to achieve the utilisation of the EID services in health facilities is referred to as quality of the EID services. Such quality aspects include level of client acceptance of the EID services, availability of the health facility factors and the level of client satisfaction with the EID services. Hence, the Donabedian theoretical framework for measuring quality in healthcare services (De Greyndt, 1995) will be used. Measuring quality has to ascertain what is being done and what was supposed to be done as a blaming procedure (de Greyndt, 1995). With Donabedian (1988) conceptual framework for measuring quality of care there are three components: structure (inputs), process (activities) and outcome (results). This approach is widely used to assess healthcare services and hence suitable for measuring the utilisation of EID services provided in health facilities.

(i) Structure

The structure describes programme inputs or efforts that enhance the healthy facility readiness to provide the intended services when clients come for the required services (Warren, 2015). Constant availability of resources needed for provision of quality services is crucial with adherence to the guidelines and protocol; for example, human resources that are responsible for provision of quality offered, PMTCT services rendered to HIV positive women and their HIV exposed babies (Kisika, 2015).

With reference to figure 1, the inputs includes the competence of healthcare workers, availability of healthcare works, training offered to healthcare workers, availability of cotrimoxazole and prophylaxis drugs and availability and reliability of sample and results transportation system. For this study, the structure component covers only the availability of competent healthcare workers (human resource), availability of EID materials and availability and reliability of the sample and results transportation system.

Figure 2:1 Donabedian's framework for measuring quality in healthcare



Adopted from Donabedian, (2003) with modification

(ii) Process

Process refers to actual implementation of various activities or procedures that take place daily in health facilities that need to be performed by health providers so that clients received quality care (Kisika, 2015). This includes a number of factors such as technical competence that involves application of knowledge and skills in line with the use of standard guidelines and protocols. Activities done by healthcare providers include counselling HIV patients, giving appointments to the patients for picking results of HIV test, documenting client information and keeping register books accordingly. Hence, appropriate training is required for the healthcare provider to be able to carry out his/her assigned activities. In process stage valid judgement about quality care can be drawn effectively because of the actual implementation of the activities that take place. Donabedian (1988) noted that it is easy to obtain information on quality care during process stage using different tools such as: direct observation, interview and medical record review. Observation procedure/ method includes health providers giving counselling to pregnant woman or breastfeeding mothers, in this activities the assessor will observe the application of skills and techniques counselling, interaction between healthcare providers and HIV positive women during counselling, how healthcare providers apply skills to convince the HIV positive HIV woman to accept the lifelong ART and to promote continuity (Kisikia, 2015). As far as the utilisation of Early Infant Diagnosis for HIV infection Donabedian's framework is quite applicable as healthcare workers are involve in counselling, testing, and treatment and follow up activities (processes).

(iii) Outcome

This refers to changes in individuals (Donabedian, 2003). Furthermore, de Geyndt (1995) describes outcomes as the end result of the process of client care. According to Donabedian (1998), outcome can also include the changes in bahaviour and the degree of patient satisfaction. Hence, in this study the outcome/output included the utilisation of the EID services (that is client satisfaction with the EID services, reduction/termination of infant morbidity and mortality)

2.2 Empirical Literature Review

2.2.1 Assessment of Quality of PMTCT Services

Kisika (2015) performed the assessment of quality of PMTCT services provided to HIV positive women and their HIV exposed infants in Iringa District Council basing on availability, compliance and outcome of care as evaluation dimensions. In the theoretical analysis the author used the Donabedian's framework for measuring quality in healthcare. This model had inputs, activities / process and the outcome.

Using a sample of 50 respondents covering mothers as clients for PMTCT, RCH and EID services, he collected data using observation, face to face interviews with HIV positive women who were registered in PMTCT programme and those who were lost to follow-up. The method was applied in a discussion form with key informants in what is called in-depth interviews.

The observation method was also used to PMTCT providers on application of counselling skills and their interaction with the clients. The study findings revealed presence of some supplies and facilities required for the provision of PMTCT services. However, it was realised that there were deficiencies in the structure, process and outcome that required for providing the PMTCT services. The study indicated that about half of the respondents had different views, both negative and positive, on the quality of PMTCT services they received due to deficiencies structural and commonest problem is inadequate supervision.

The results also showed that there are gaps in the process where the majority of the midwives demonstrated poor skills in counselling whereas about half of the respondents did not gather information. Almost all women and their HIV exposed infants were not examined. It was concluded that PMTCT services providers in Iringa District are of poor quality. The Donabedian model used by Kisika in assessing the quality of PMTCT services in Iringa District Council is very applicable to the assessment of the Early Infant Diagnosis of HIV infection and the related Health facility factors. Kisika was interested in the satisfaction of the clients with the PMTCT services whereas this study basically focusses on the level of acceptance of the EID services, the effectiveness / adequacy of health facility factors and the influence of the

three selected health facility factors on the utilisation of EID services in Kilolo District Council.

2.2.2 Utilisation of the Early Infant Diagnosis (EID) of HIV Infection

Gamaliel (2012) conducted the study to determine the magnitude and factors influencing utilisation of EID among HIV-exposed infants as tracer factors to be shared at different levels of policy making to facilitate planning and proper implementation of EID for HIV in Coast Region of Tanzania. A cross-sectional study was conducted in Kibaha and Bagamoyo districts in Coast region involving all HIV-exposed infants aged between 4 weeks to 18 months born live to HIV-infected mothers.

The cross-sectional approach of the study was appropriate due to the fact that Gamaliel was able to get various responses from different health facilities and this ruled out the possibility of getting biased answers / responses. Through detecting common trends on the responses obtained from different health facilities then Gamaliel was assured of the correctness of the real status of EID services in the health facilities found at the Coast Region.

In Gamaliel study, data were collected through interviewing mothers/guardians of HEI using a structured questionnaire, in which CTC cards were used to countercheck linkage to CTC. A checklist was used to collect data specific for health facilities through interview of healthcare providers and observation. A total of 238 parents/guardians of HIV-exposed infants/children from five (5) facilities in Coast region were involved in the study. The HIV testing among HIV-exposed infants within the healthcare facility was 87%. The prevalence of HIV infection among HIV-exposed infants who were tested by HIV-1 DNA PCR method was 13%. All facilities had availability of commodities for EID of HIV, trained human resources, system of identification of HIV-exposed infants. In univariate analysis, early HIV testing during pregnancy, PMTCT ARV prophylaxis, disclosure of HIV status, enrolment to CTC, frequent attendance to EID services, co-trimoxazole prophylaxis and exclusive breast feeding were found to be significant predictors for testing of HIV-exposed infants. In multivariate analysis, monthly attendance to HIV EID clinic was independent

significant predictor (AOR 2100, 95% CI, 3.3 -1314904 $p < 0.05$) for testing of HIV-exposed infants.

Gamaliel's study results paved a good way during design of the study objectives, methodology and data analysis variables. Having gone through the several variables identified by Gamaliel as health facility factors, the author of this study based on the healthcare workers, availability of EID materials and the availability of the sample and results transportation system in assessing the influence of health facility factors on the utilisation of the EID of HIV in Kilolo District in which case the author identified two variables independent (health facility factors) and dependent variables (utilisation of EID of HIV at Kilolo health facilities).

With the results above obtained, Gamaliel (2012) recommended that the Tanzania government has to focus on implementation of global plans for elimination of Mother to child HIV transmission (e-MTCT) through strengthening of the existing system and collaboration with different partners stakeholders to scale up EID services to all levels of health facilities. Basing on Gamaliel (2012) research design, data collection methods, sampling theorems, data analysis approach the author noted that Gamaliel study was worthy to refer in the design of the study for assessing early infant diagnosis of HIV infection in Kilolo District Council.

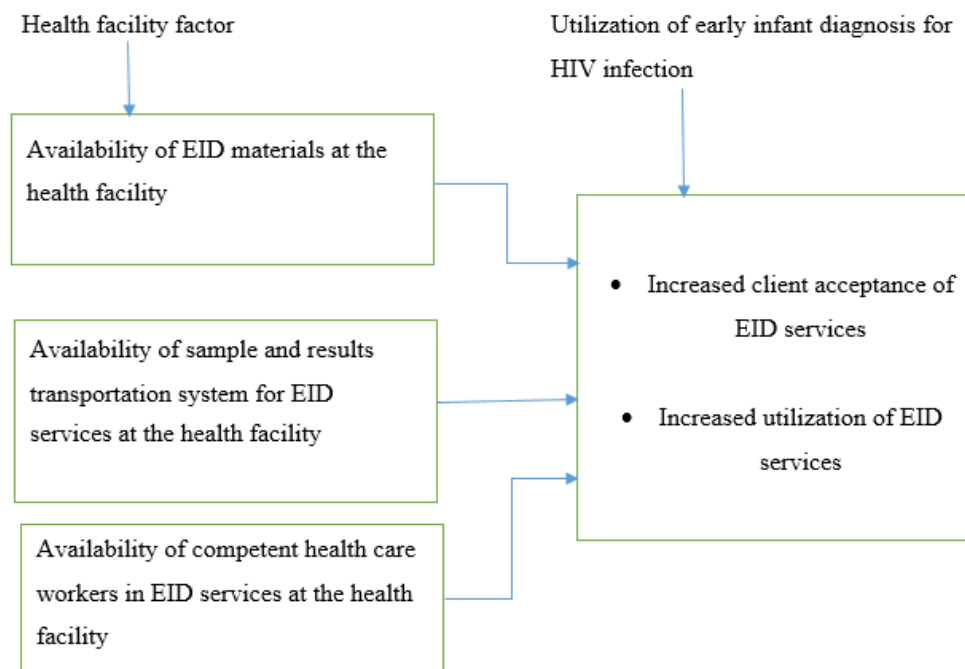
The interview approach used by Gamaliel was also used in this study where data were collected from respondents in the form of 5 point Likert scale structured questions. In terms of data analysis approach Gamaliel used Epidata version 3.1 and Stata software version 12.1. Unlike Gamaliel's data analysis approach in this study data was analysed using Statistical Package for Social Science (SPSS) data analysis programme. The reason for using SPSS analysis programme was the fact that the author wanted to determine the level of acceptance / agreement on the EID programme in Kilolo District Council. No matter the adequacy or effectiveness of the EID programme available at Kilolo District Council the author wanted to know how far the mothers / guardians accept or deny the EID services and this was a good approach for assessing the utilisation of EID services. SPSS software was preferred for easier analysis of the research data as it is easier in SPSS programme to run regression and obtain the coefficients as the reference for assessing the influence of the health facility factors on

utilisation of the EID of HIV at Kilolo health facilities. Further details on coefficients and data analysis are found in chapter three and chapter four respectively.

2.3 Conceptual framework

As indicated in Figure 2, health facility factors are the input factors into the EID programme. The health facility factors are independent variables in the sense that they depend on the utilisation of Early Infant Diagnosis (EID) programme. The utilisation of the EID programme is the output factor / outcome from the EID programme. Hence, the utilisation of the EID programme is the dependent variable.

Figure 2:2 Conceptual Framework of the Utilisation of EID Services



Source: Researcher's Conceptual Model (Rwechungura, 2016)

Hence, in order that the EID services are utilised as expected by the programme planners and developers, such services need appropriate EID materials (M), appropriate sample and results transportation system (S), competent healthcare workers (H) and acceptance of the EID services by the healthcare workers.

The three input variables (H, M and S) were assessed separately and then using regression analysis the influence of each input factor to the utilisation of EID services was established. The equation for the study model to assess the influence of the health facility factors (H, M and S) was given by: $U = \alpha_1 H + \alpha_2 M + \alpha_3 S$, where α_1 , α_2 , α_3 and α_4 are coefficients.

After running regression, whenever, any of the coefficients (α_1 , α_2 or α_3) is positive then that health facility factor has a positive correlation with or influence on the utilisation of the EID services, that is, improving the health facility factor implies improving the utilisation of the EID services at the health facility. The negative value of the coefficient would imply that there is a negative correlation of the health facility factor and the utilisation of the EID services at the health facility which would imply that the fall in effectiveness of that particular health facility factor does not necessarily imply the fall of the utilisation of the EID service.

2.4 Hypotheses

From background information, theoretical and empirical frameworks, three hypotheses were developed. They were tested to determine whether they are true or not as part of assessing fulfilment of the study objectives. The following hypotheses were tested:

- H1: Availability of competent healthcare workers at Kilolo health facility positively influences utilisation of EID services
- H2: Availability of EID materials at Kilolo health facility positively influences utilisation of EID services
- H3: Availability of sample and results transportation system at Kilolo health facility positively influences utilisation of EID services

CHAPTER THREE

EVALUATION METHODOLOGY

3.1 Evaluation approach

Structural, process and outcome evaluation approaches were used to assess the influence of health facility factors on the utilisation of EID of HIV services (Donabedian's framework, 2003). Structural approach was chosen for assisting in identifying all the input health facility factors and then identifies the most significant ones to base on for assessing the adequacy of EID services.

The process approach due to the fact that as recommended in Donabedian's theory for measuring quality of health services, it was easier to identify / list the activities performed by the healthcare providers. Hence, knowing what they are supposed to do it was easier to assess what they do not do and from there establish the reasons whether it was due to competence or just dissatisfaction with EID service itself. The outcome approach was chosen due to the fact that it was used to measure the EID service results or output. This was done basing on the level of acceptance or satisfaction for the mothers / guardians of the HIV exposed infants who were involved in the EID services.

3.2 Evaluation design

In this study, a cross – sectional research design was employed. There were a number of documentary and literature reviews done before the evaluation design itself. The next step was to decide on the study methodology and data analysis approach. After the selection of study methods, the study variables (input factors: healthcare workers, EID materials and availability of sample and results transportation system and output/outcome factor: utilisation of EID of HIV at the health facility) were identified. It was then decided that the input factors be independent variables and the output factor(s) be dependent variable basing on Donabedian's framework for measuring quality of healthcare services. This was followed by the design of the study conceptual framework as shown in chapter two.

Having decided on study variables, the data collection tools were developed (mainly structured 5 point Likert scale questionnaires).

The designed data collection tools were tested on their accuracy by performing the pilot study involving 8 respondents, that is, 4 respondents from Idete dispensary and 4 respondents from Kilolo hospital. The 4 respondents at each health facility involved 2 mothers whose HIV exposed infants were enrolled in the EID services at the Health Facility and 2 healthcare providers dealing with EID services at the health facility. The data was collected using the 5 point Likert scale structured questionnaire. The 8 respondents were obtained in consultation with Idete and Kilolo facility authorities who linked the author with the 8 respondents for the pilot study.

During pilot interviews, questions were modified to correct errors and to remove ambiguities. After the pilot data collection, the final questionnaire was prepared. This questionnaire was used in the study for collecting the research quantitative data. Having obtained the clear questionnaire, the descriptive analysis approach of quantitative data was chosen for assessing the utilisation of EID services and for assessing the influence of the health facility factors on the utilisation of EID services in Kilolo health facilities. Finally, data was analysed using SPSS programme which was followed by the presentation and discussion of study results.

3.3 Evaluation period

The evaluation was conducted at the selected ten health facilities in Kilolo District Council from May to June, 2016. After the assessment of the utilisation of EID services and the assessment of the health facility factors and their influence on the utilisation of EID services, the study results were presented and then discussed.

3.4 Study area

In terms of environmental and health facility context, this study covered ten health facilities in Kilolo District Council, that is, one hospital (Ilula Hospital), two Health Centres (Kidabaga and Mtandika) and 7 Dispensaries (Idegenda, Lyasa Image, Bomalang'ombe, Ilula Mwaya, ibumu, Idete and Ifuwa). Kilolo was selected as the study area due to the fact that there were several HIV related infant mortalities and bearing in mind that PMTCT and EID services were established for reducing child

The target population was the healthcare workers providing PMTCT services in health facilities, Mothers/Guardians registered in the PMTCT programme and whose HIV exposed infants are enrolled in the EID programme at the health facility. The assessment included adults aged between 20 – 60 years, however, some respondents were outside the range as shown in presentation of results in chapter four.

3.6 Sample Size and Sampling Procedures

3.6.1 Sample Size

There were a total number of 200 respondents in this study. 100 respondents were clients attending EID services at the health facility; these included mothers, fathers or guardians of HIV exposed infants. During the study 100 mothers/guardians of HIV exposed infants and children aged between 4 weeks and 18 months were used as respondents on questions regarding satisfaction with EID services.

One hundred (100) respondents were healthcare workers dealing with EID services at the health facility, that is, from each of the 10 selected health facilities, the author selected 10 healthcare workers by judgment and interviewed them basing on the 5 point Likert scale questionnaire.

The sample for 100 clients coming at the health facility for EID services of their HIV exposed infants was obtained by using the following formula.

$$n = \frac{z^2 p (100-p)}{\epsilon^2}$$

Where:

n= sample size

z= point of standard distribution

p= proportion of infants with HIV infection in Tanzania (7% from UNAIDS Report 2010)

ϵ = margin of error on estimate

$$\begin{aligned} n &= \frac{1.96^2 \times 0.07(100-0.07)}{0.05^2} = \frac{3.84 \times 7 \times 93}{5 \times 5} \\ &= 100 \end{aligned}$$

3.6.2 Sampling Procedures

Kilolo district council was purposively selected due to high prevalence of HIV among pregnant women. Random and purposive samplings (Kothari, 2004) were used in identifying the study population. The study population involved healthcare workers providing clients with EID services at health facilities in Kilolo District Council and clients (mothers / guardians) related with HIV exposed infants undergoing EID services at the selected 10 health facilities. Ten health facilities implementing EID for more than 3 years and with many clients were selected for the study as shown in Table 3.1.

Table 3:1 Selected Health Facilities in Kilolo District involved in the Study

S/N	Health Facility	Council	Ward	Village/Mtaa
1.	Ilula Hospital	Kilolo DC	Kilolo	Kilolo
2.	Idegenda Dispensary	Kilolo DC	Masisiwe	Idegenda
3.	Lyasa Image Dispensary	Kilolo DC	Image	Lyasa Image
4.	Bomalang'ombe Dispensary	Kilolo DC	Boma la Ng'ombe	Boma la Ng'ombe
5.	IlulaMwaya Dispensary	Kilolo DC	Nyalumbu	Ilula Sokoni
6.	Ibumu Dispensary	Kilolo DC	Ibumu	Ibumu
7.	Idete Dispensary	Kilolo DC	Idete	Idete
8.	Ifuwa Dispensary	Kilolo DC	Udekwa	Ifuwa
9.	Kidabaga Health centre	Kilolo DC	Dabaga	Kidabaga
10.	Mtandika Health centre	Kilolo DC	Ruaha Mbuyuni	Mtandika

The author briefed each of the health administrators of the selected health facility on the need of assessing the utilisation of EID services for selected health facilities in Kilolo District Council. According to the nature of the study, healthcare workers working in RCH were purposively selected. Random sampling was applied where every mother/guardian with HIV exposed child aged between 4 weeks up to 18 months brought to the health facilities had an equal chance of being involved in the research. Mothers/Guardians and those staff were informed the enquiry to be conducted with the author / researcher, however, did not mention the subject matter for avoiding one respondent from influencing the other on the EID utilisation

responses. This was due to the fact that the scale for agreement was to be used in assessing the level of satisfaction of the client with EID services and for assessing the competence of healthcare workers and their experience on the availability of EID materials and sample and results transportation system.

Each health facility administrator linked the staff and clients to the author. The author provided questionnaires to each of the 10 healthcare workers and each of the 10 clients (mothers/guardians related to HEI children registered in EID services) at each health facility. Each respondent filled the questionnaire within 30 to 60 minutes. Two days were spent in collecting responses from each health facility. Hence, a total of twenty days was spent in collecting data from the ten health facilities in Kilolo District Council.

As shown in Table 3.2, the sample size for the study was 200 respondents (including 100 healthcare workers and 100 mothers/guardians for the HIV exposed infants enrolled in EID services). Furthermore, the number of respondents was obtained by judgement basing on the similar studies conducted in Tanzania for evaluating utilisation of Early Infant Diagnosis of HIV infection (Gamaliel, 2012 and Kisika, 2015).

Table 3:2 Selected Respondents for Responding to Research Questions

S/N	Health Facility	Level of Facility	Number of parents / guardians	Number of Healthcare Workers
1.	Ilula	Hospital	10	10
2.	Idegenda	Dispensary	10	10
3.	Lyasa Image	Dispensary	10	10
4.	Kidabaga	Health centre	10	10
5.	Bomalang'ombe	Dispensary	10	10
6.	Ilula Mwaya	Dispensary	10	10
7.	Ibumu	Dispensary	10	10
8.	Idete	Dispensary	10	10
9.	Ifuwa	Dispensary	10	10
10.	Mtandika	Health centre	10	10
TOTAL			100	100

3.7 Study units of analysis

The study units were mothers/guardians registered in the PMTCT programme and whose HIV exposed infants are enrolled in the EID programme at the health facility. The units also included EID and PMTCT healthcare providers.

3.8 Study variables

Other elaborated in the study conceptual framework (chapter two), there are two categories of variables used in the study. Such variables are described below:

3.8.1 Dependent Variable

The dependent variable measured was the utilisation of EID services (U) offered to HIV exposed infants in Kilolo health facilities. The utilisation (U) was evaluated based on the influence of health facility factors on increase or decrease of the utilisation of EID services. The level of client acceptance or satisfaction with the EID services was an input to the utilisation of EID services at the health facilities. Utilisation was determined and measured using 5 point Likert scale structured questionnaires. The values for all the responses to utilisation of EID services were averaged by using the transform and compute variable functions built in the SPSS data analysis programme to obtain values for a single (averaged variable) called “*EID_Utilisation*”. Details on the study variables and related correlation / influence on the utilisation are provided in chapter four by using regression analysis results.

3.8.2 Independent Variables

The independent variables used were selected three health facility factors: availability of healthcare workers (H), availability of EID materials (M) and availability of sample and results transportation system (S). These were found to be the major health factors influencing the utilisation of EID services in Tanzania and hence necessitating the need to conduct the study for assessing / evaluating the influence of such variables on the utilisation of EID services in Kilolo health facilities. The relation of the independent variable to the dependent variable was given by the equation:

$U = \alpha_1 H + \alpha_2 M + \alpha_3 S$, where α_1 , α_2 , α_3 and α_4 are coefficients and U is the utilisation of EID services. Responses for questions entered in SPSS programme for each variable were averaged to combined values for the three variables, that is, for healthcare workers (H), EID materials (M) and availability of sample and results transportation system (S). This was done by using transform and compute variable functions built in the SPSS data analysis programme. This was preceded by creating the equation involving the variable name and the mean of questions values in the format: variable name = mean (Q1, Q2, Q3, Q4, Q5). Hence, for each variable, the Likert scale values were average for all questions. After averaging values for all questions, the two independent variables were obtained, that is, “*Health_Worker*” implying healthcare workers and “*Sample*” implying availability of sample and results transportation system

3.9 Data Measurement Plan

Data was measured using Likert-Type Scale basing on the level of agreement to the questions asked. Likert Scale is a psychometric response scale primarily used in questionnaires to obtain participant’s preferences or degree of agreement with a statement or set of statements (Matell & Jacoby, 1971). Likert scales are a non-comparative scaling technique and are one-dimensional (only measure a single trait) in nature. With reference to the study objectives in chapter one, the trait measured in this study was the utilisation of Early Infant Diagnosis (EID) of HIV infection. However, to fulfil the study objectives the following were measured:

- i. The influence of availability of EID materials on utilisation of EID services at Kilolo health facility;
- ii. The influence of availability of sample and results transportation system on utilisation of EID services at Kilolo health facilities;
- iii. The influence of competent healthcare worker on utilisation of EID services at Kilolo health facilities;
- iv. The extent of satisfaction of clients (mothers / guardians) with EID services.

The measurement type for the collected data was five point Likert Scale. 5-point scale ranges from “Strongly Disagree” on one end to “Strongly Agree” on the other end with neither “Neither Agree nor Disagree” in the middle.

However, some practitioners advocate the use of 7 and 9-point scales which add additional granularity. Sometimes a 4-point (or other even-numbered) scale is used to produce a (forced choice) measure where no indifferent option is available. Each level on the scale is assigned a numeric value or coding, usually starting at 1 and incremented by one for each level (Matell & Jacoby, 1971).

For regression analysis assignment of values has to start with 1 for strongly disagree and then proceed with the assignment in ascending order up to 5 for strongly agree. Assignment in the reverse order may lead to wrong results. Before analysing data, using the order shown in the questionnaire, the assignment of values was done starting from 1 for strongly disagree towards 5 for strongly agree.

With respect to study objectives, data was measured using both descriptive statistics for respondent characteristics and regression analysis for assessing the influence of health facility factors on the utilisation of EID services at health facilities. Five-point Likert Scale was selected for this study due to the fact that it was easier for the author to measure the research objectives using this scale. Other software packages like Microsoft Excel would have been used; however, they do not have in-built capabilities for determining the variable coefficients which are the criteria for assessing the influence of certain variables on the others.

3.10 Types and sources of data

The data obtained during the study were mainly quantitative. Primary data were collected using questionnaire with 5-point Likert scale. Secondary data was obtained by using documentary reviews and observation. The use of documentary review and observation was a supplementary approach to the answers obtained using structured questionnaires.

3.11 Data Quality

Before data was analysed, it was tested and verified that it is of appropriate quality in order to ensure that findings of the research are realistic. For this purpose data was tested for both reliability and validity.

3.11.1 Reliability

Reliability is the quality of consistency or measurement (Yin, 2013). The study was designed in such a way that it was reliable for similar repeated researches. The design was such that if the researcher repeats the study it would in no doubt produce the same results (Kothari, 2004). Data reliability is concerned with consistency of data collection instruments in terms of producing the same responses to the questions (Saunders, Lewis & Thorn, 2003). It is the ability to obtain similar results by measuring an object, trait or construct with dependent or comparable measures (Sprinthall, 1997). Reliability was determined through pilot-testing the research instruments to eight respondents employed in the health facilities in Kilolo District. The responses that were given were evaluated to see whether they were similar. Also, Cronbach Alpha was employed in testing the internal consistency reliability of the research instruments with the help of SPSS. Thus, any discrepancy discovered was addressed by modifying the question items in the research instruments

3.11.2 Validity

Validity is the ability of the measuring instrument to measure what it claims to measure (Saunders, Lewis & Thorn, 2003). Validity explains how the study findings reflect the true situation (Lufumbi, 2011). To ensure validity the questionnaire (measuring instrument) was pilot-tested for ensuring that respondents would understand the questions and thus be able to respond to questions giving the sense intended by the researcher. Thus, the pilot study refined the questionnaires.

3.12 Data Management and Analysis Methods

Before data analysis process, data were cleaned from errors. Using the SPSS programme, variables were created using the variable view and data were then entered into computer using SPSS data view. Data was analysed using descriptive analysis and regression analysis. The coefficients for establishing the influence of health facility factors on the utilisation of EID services were established using regression analysis.

The level of satisfaction of the clients with EID services was determined through the SPSS simulation results. As shown in chapter four, the simulation results indicated the clients' degree of accepting or rejecting EID services.

3.13 Ethical issues

Ethical approval was obtained from Mzumbe University. A written consent was obtained from the parents/guardians of each infant and healthcare worker upon understanding the purpose of the study. Participation in the study was voluntary, healthcare workers and parent /caregiver who consented to participate in the study had to sign the consent form. Permission to collect data was sought from relevant regional and district authorities. These were mainly the Regional Administrative Secretary (RAS), Iringa Region and Kilolo District Executive Director (DED).

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Introduction

The main research question was “what is the influence of health facility factors on utilisation of EID services in Kilolo health facilities?” This main question had four specific research questions, namely what is the extent of the availability of EID materials and their influence on utilisation of EID services at Kilolo health facilities? What is the extent of availability of sample and result transportation system and its influence on utilisation of EID services at Kilolo health facilities? To what extent are healthcare workers competent in carrying out EID services and their influence on utilisation of EID services at Kilolo health facilities? And to what extent are mothers / guardians of HIV exposed infants satisfied with EID services provided in Kilolo health facilities?

This chapter presents the study results basing on the responses to the research questions above. It begins by elaborating on demographic characteristics of respondents. It further provides results on the assessment of the influence of health facility factors on the utilisation of EID services. The chapter further elaborates on the assessment of availability of EID materials at health facilities which is followed by assessment of the sample and results transportation system used in EID services. The chapter further assesses the competence of healthcare workers in providing EID services at the health facilities using descriptive analysis where summarised data is put in a tabular form. Finally, this chapter provides summary results on the influence of health facility factors on utilisation of EID services and factors influencing the utilisation of EID services in Kilolo health facilities.

4.2 Demographic Characteristics of Respondents

This section presents a description of the demographic characteristics of respondents involved in the collection of data for assessing the EID services in 10 selected health facilities in Kilolo District Council. A total of 100 respondents were involved in responding to the questionnaires. Seventy percent (70%) of the EID clients (mother/guardians) were from the dispensaries; ten percent (10%) and twenty percent

(20%) were from hospital and health centres respectively. In terms of the age groups, 7% were of the age group between 15 - 20 years, twenty five percent (25%) of the age group 20 – 40 and fifty percent (50%) of the age group 41 – 50 which was the largest age group. Eighteen percent (18%) of the respondent covered the age group above 50 years. Further details on the characteristics of respondents are given in Table 4.1.

Table 4:1Demographic Characteristics of Respondents (N = 100)

Characteristics	Frequency	Percentage
Level of facility		
Hospital	10	10%
Health centre	20	20%
Dispensary	70	70%
Total	100	100%
Age group		
15 - 20 years	7	7%
20 - 40 years	25	25%
41 - 50 years	50	50%
Above 50 years	18	18%
Total	100	100%
Level of education		
No formal education	9	9%
Primary education	31	31%
Secondary education	45	45%
College education	8	8%
Degree and above	7	7%
Total	100	100%
Occupation		
Employed	25	25%
Own Business	28	28%
Dependent	47	47%
Total	100	100%
Marital status		
Single	12	12
Married	51	51
Cohabiting	37	37
Total	100	100%
Relation of respondent with		
Infant		
Mother	53	53
Father	9	9
Guardian	38	38
Total	100	100%

Source: Field data (2016)

4.3 Results (Descriptive information)

4.3.1 Influence of Availability of EID Materials on Utilisation of EID Services

This variable was selected just for investigating on whether availability of EID materials has influence on the utilisation of EID services at health facilities. The assumption about this variable was that; availability of EID materials at Kilolo health facilities positively influences utilisation of EID services. The research question was *“what is extent of the availability of EID materials and their influence on utilisation of EID services at Kilolo health facilities?”* As shown in Table 4.2 the respondents to this question were healthcare workers. Healthcare workers were chosen as respondents due to the fact that they are involved with EID services including counselling HIV clients, testing HIV status and providing treatment to HIV clients. Hence, such respondents were quite informed on responding to technical questions regarding utilisation of EID services.

The assessment of the availability of EID materials was done basing on the responses provided by the healthcare workers. The results showed that sixty one percent (61%) of the healthcare providers reported that there were no sufficient RCH cards at the health facilities. However, sixteen percent (16%) of the healthcare workers reported that there are enough RCH cards at the health facilities. Twenty eight percent (28%) of the respondents reported that they have EID job aids although thirty percent (30%) of the respondents reported that they do not have EID job aids (e.g. guidelines and postures). Other levels of availability on the EID materials are given in Table 4.2 on whether the health facility runs out of EID materials, whether all the time the health facility have cotrimoxazole drugs, whether there are adequate DBS materials at health facilities and whether the EID job aids are being used or not.

Although twenty eight percent (28%) of the healthcare workers reported that they had EID job aids (e.g. guidelines and posters) at their health facilities, twelve percent (12%) of healthcare workers reported that such job aids were not in use. Forty one percent (41%) of healthcare workers reported that the job aids at their health facilities were in use. Fifty seven percent (57%) of healthcare workers reported that sometimes they run out of stock of EID materials at their health facilities.

Forty four percent (44%) of healthcare workers reported that sometimes they do not have ARV prophylaxis drugs for HIV Exposed infants at their health facilities.

The results of the study using regression analysis in section 4.4 showed that availability of EID materials at health facility positively influences utilisation of EID services. Based on these findings, availability of EID materials is an important determinant for utilisation of EID services.

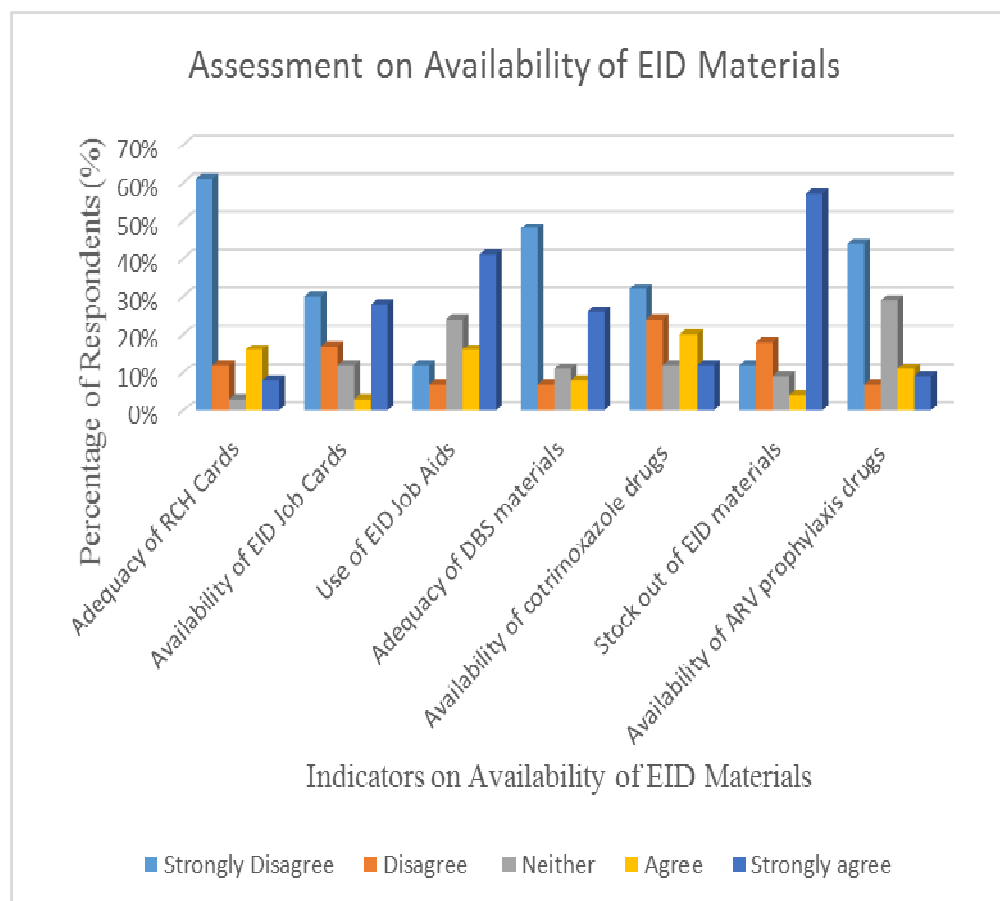
Table 4.2: Healthcare Workers' Responses on Availability of EID Material at the Health Facility (N=100)

S/N	Question	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1.	Do you have sufficient RCH cards at your Health Facility?	61%	12%	3%	16%	8%
2.	Do you have EID job aids (e.g. guidelines and posters) at your health facility?	30%	17%	12%	3 %	28%
3.	Are the available job aids in use?	12%	7%	24%	16%	41%
4.	Are there adequate DBS materials at your health facility?	48%	7%	11%	8	26%
5.	Do you have all the time cotrimoxazole drugs at your health facility?	32%	24%	12%	20%	12%
6.	Do you sometime run out of stock of EID materials at your health facility?	12%	18%	9%	4 %	57%
7.	Do you have all the time ARV prophylaxis drugs for HIV Exposed infants at your health facility?	44%	7%	29%	11%	9%

Source: Research Survey data (Rwechungura, 2016)

The data presented in Table 4.2 is further illustrated in Figure 4.1 as follows:

Figure 4.1: Responses by Healthcare Workers on Availability of EID Materials



Source: Research Survey data (Rwechungura, 2016)

In Figure 4.1 the 4 highest bars summarise major observations on the opinions of healthcare workers on availability of EID materials at health facilities. From the figure it can be seen that those who said strongly disagree were leading in percentage followed by those who said strongly agree.

4.3.2 Influence of sample and results transportation system on utilisation of EID services

The reliable sample and results transportation system implied that clients would get their EID test results as required by the EID programme and hence a reasonable input to the utilisation of EID services. That being the case there was a need to assess the

contribution or influence of the sample and results transportation system to the EID services. The evaluation question was “*what is the extent of the availability of sample and result transportation system and its influence on utilisation of EID services at Kilolo health facilities?*” The respondents to this evaluation question again were healthcare workers. There were 100 healthcare workers. Due to their day to day activities at the health facility, healthcare workers had basic skills for responding to questions regarding sample and results transportation system. The questions to healthcare workers on sample and results transportation system were used for both determining the influence of sample and results transportation system on utilisation of EID services, and assessing availability of the sample and results transportation system.

As shown in Table 4.3, fifty five percent (55%) of the healthcare workers reported that sample and results transportation system are available at the health facility although twenty four percent (24%) of the healthcare workers reported that there are no sample and results transportation systems in place. Sixty percent (60%) of the respondents reported that the DBS sample and results are not transported on weekly basis. Forty three percent (43%) of the respondents reported that the sample and results transportation system is not reliable. Previously, the data showed that utilisation was low (38%). This implies that, the assumption of the study “*availability of sample and results transportation system at Kilolo health facility positively influences utilisation of EID services*” is valid. Further, results on this study in section 4.4 showed that availability of sample and results transportation system at Kilolo health facilities positively influences utilisation of EID services. Other results on the aspects under assessment on the availability of sample and results transportation system are given in Table 4.3.

Table 4.3 Healthcare Workers’ Responses on Sample and Results Transportation System (N = 100)

S/N	Question	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1.	Availability of sample and results transportation system	7%	24%	4%	10%	55%
2.	Whether the system operates as planned	42%	8%	30%	11%	9%
3.	Whether DBS sample and results are transported on weekly basis	60%	4%	14%	8%	14%
4.	Whether the system is reliable	43%	16%	7%	4%	30%
5.	Whether there are schedules on sample and results transportation systems	2%	20%	11%	10%	57%

Source: Research Survey data (Rwechungura, 2016)

4.3.3 Influence of competent Healthcare Workers on Utilisation of EID Services

This variable was selected in order to determine the effect of competent healthcare workers on utilisation of EID services. The evaluation question was “To what extent are healthcare workers competent in carrying out EID services and their influence on utilisation of EID services at Kilolo health facilities?” There were 100 healthcare workers who responded to the third evaluation question. The study hypothesis was that: *availability of competent healthcare workers at Kilolo health facility positively influences utilisation of EID services.*

As shown in Table 4.4, the SPSS simulation results showed that there are various degrees of agreement and disagreement with the check list inquiries. Forty nine percent (49%) of the healthcare workers reported that they do not have enough knowledge for performing the early infant diagnosis activities for HIV infection.

Eleven percent (11%) of the healthcare workers neither agreed nor disagreed for inquiry regarding EID skills and knowledge. Furthermore, Thirty eight percent (38%) of healthcare workers reported that they are not aware with EID policies and guidelines at the health facilities.

Although fifteen percent (15%) of the healthcare workers reported that they have awareness on EID policies and guidelines, thirty eight percent (38%) of the healthcare workers reported that they are not aware with the EID policies and guidelines. Twenty five (25%) of healthcare workers neither agreed nor disagreed; this was probably due to the fact that they were not aware with the meaning and significance of the policies and guidelines in EID services. Forty four percent (48%) of the healthcare workers reported that they had already participated in enrolling HIV infants in RCH clinic to HIV test services.

Fifty one percent (51%) of healthcare workers reported that they had counseling skills to HIV positive pregnant mothers. Forty five percent (45%) of the healthcare workers reported that they do test HIV for infants registered at their RCH clinic. Further responses by healthcare workers on availability of competent healthcare workers at health facilities are given in Table 4.4.

Regression analysis results in section 4.4 showed that availability of competent healthcare workers at Kilolo health facilities negatively influences utilisation of EID services in the sense that having competent healthcare workers does not necessarily imply the increased utilisation of EID services at the health facility. This could be due to misunderstanding of the questions by some of the healthcare workers. Competent healthcare workers are an important input in implementing EID programme services hence we expect it to have a positive influence on utilisation of EID services contrary to the study finding. There are some of the factors that may trigger competent healthcare workers to perform well their duties related to EID services at the health facility. Such factors would include the level of supervision of healthcare workers and the level of motivation of healthcare workers; for instance, motivation through loans, salary remuneration and other fringe benefits. Since, the study was limited to establishing the influence of availability of competent healthcare workers at health facility on utilisation of EID services, factors on why availability of competent

healthcare workers negatively influences utilisation of EID services were just determined by the author due to his long experience in related medical services.

Table 4.4: Healthcare Workers' Responses on their Competence in carrying out EID Services (N=100)

S/N	Question	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1.	Agreement on having enough knowledge and skills in providing EID services	49%	20%	11%	12%	8%
2.	Awareness on EID policies and guidelines	38%	12%	25%	15%	10%
3.	Counselling skills to HIV positive pregnant mothers	12%	7%	12%	18%	51%
4.	Participating in enrolling HIV infants to HIV test services	5%	20%	17%	12%	48%
5.	Having ability to inform clients to come for infant HIV test results	19%	8%	6%	27%	40%
6.	Whether they test HIV for infants registered at RCH clinic	10%	9%	21%	15%	45%

Source: Research Survey data (Rwechungura, 2016)

4.3.4 Assessment of satisfaction of mothers / guardians of HIV exposed infants on EID services

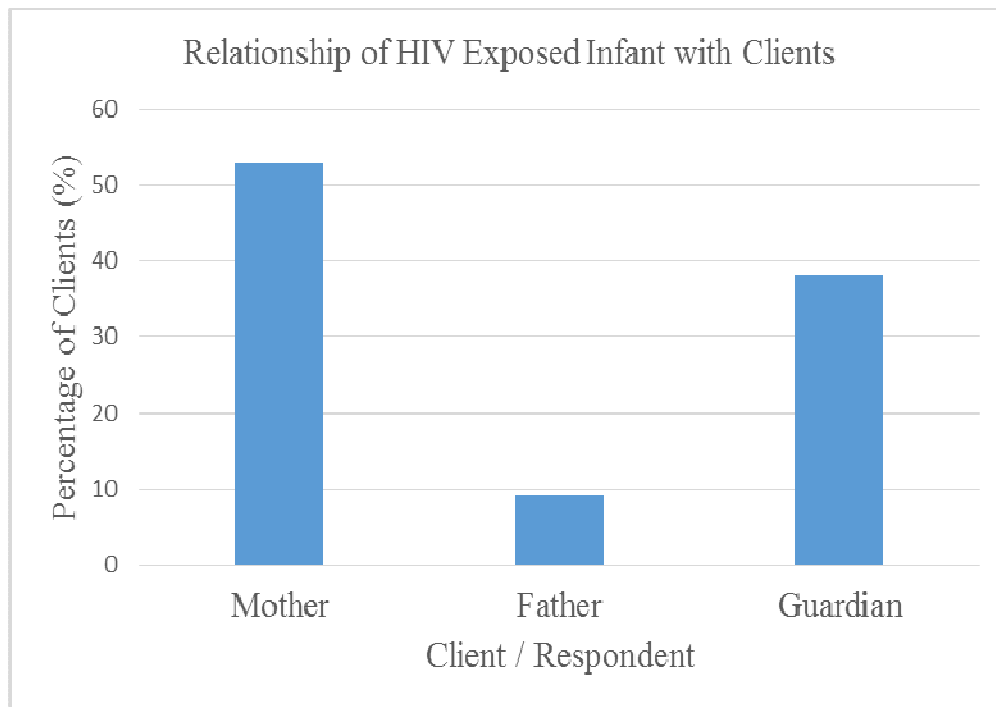
The three independent variables in the previous sections were used to examine whether they had a positive or negative influence on utilisation of EID services; the fourth variable, that is satisfaction of clients with EID services was used for assessing utilisation of EID services in the sense that if clients coming to the health facility are

satisfied with the EID services then that implied there was increased utilisation of the EID services.

Hence, the fourth research question was “To what extent are mothers / guardians of HIV exposed infants satisfied with EID services provided in Kilolo health facilities?” A total number of 100 respondents (clients) responded to this question. According to the study questionnaire, clients included mothers, fathers and guardians. Those respondents referred to as guardians during the study were close relatives or next of kins to HIV exposed infants. As shown in Figure 4.1, out of 100 clients, fifty three percent (53%) were mothers, Nine percent (9%) were fathers and thirty eight percent (38%) were guardians to HIV exposed infants. The number of mothers was higher compared to the number of fathers and guardians due to the fact that due to cultural tendencies in Tanzanian society women were more involved with issues related to caring health of their children.

In most of Tanzanian societies women are more involved with domestic affairs than men; hence this gives them room for being closer to their HIV exposed infants than fathers. This variable was introduced to assess the relationship of the HIV exposed infant with the client as a means for assessing readiness of mothers, fathers and guardians in caring their HIV exposed infants enrolled in EID services. This assessment provided the author with the bases for educating Tanzanian society on the need of parents and guardians to care their HIV exposed infants for reducing child morbidity and mortality.

Figure 4.2 Groups of Clients who responded on Satisfaction with EID Services



Source: Research Survey data (Rwechungura, 2016)

The level of satisfaction was measured using the 6 indicators: whether the client (mother / guardian attended infant EID services for the first 4 weeks after infant birth. The other indicator was to find out whether the client followed up the infant HIV test result that was done previously. The other question was designed to indicate whether the client got infant HIV test results within a week after the EID test.

The other indicator to show the utilisation / acceptance of the EID service was to check whether the infant received cotrimoxazole drugs for the past 7 days to date and finally the other indicator for assessment was to check whether Infant HIV test results were received in time as instructed by the healthcare worker.

Fifty two percent (52%) of clients reported that they did not follow up for EID test results. This showed that they did not even know whether their HIV exposed infants were HIV victim or not. Such clients who did not go for their EID results increased chances for infant morbidity and mortality. Forty eight percent (48%) of clients reported that their HIV infants did not receive cotrimoxazole drugs for the past 7 days

to date. This implied that there were inadequate drugs which also increased chances for infant morbidity and mortality. Since the significance of the EID services was to rescue HIV exposed infants from morbidity and mortality, this showed that such clients did not utilise well the EID services. Lack of EID materials e.g. drugs made clients loose satisfaction with the EID services hence decrease in the utilisation of EID services.

Although forty five percent (45%) of the clients reported that they received EID test results in time as instructed by healthcare workers, seven percent (7%) of the clients reported results of EID test were delayed in the sense that those whose results were positive delayed in being initiated with HIV treatment; hence such infants were more vulnerable to morbidity and mortality. Delays for clients in getting results reduced their satisfaction with the EID services; hence less utilisation of EID services. Thirty six percent (36%) of the clients / respondents strongly disagreed that they did attend EID services for the first 4 weeks after infant birth. Fifty two percent (52%) of the respondents reported that they did not follow up for the test results; however, eighteen percent (18%) reported that they followed for the test results. Forty eight percent (48%) of the clients reported that they did not receive cotrimoxazole drugs for the past 7 days to the date of the study. This is a good indicator that they may not be satisfied with the EID services. Further client responses on their satisfaction with EID services are summarised in Table 4.5

Table 4.5 Client Responses on their Satisfaction with EID Services (N=100)

S/N	Indicator / Question	Level of satisfaction / Agreement				
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	Attending EID services for the first 4 weeks after infant birth	36%	10%	21%	20%	13%%
2.	Client follow up of EID test results	52%	7%	15%	8%	18%
3.	Getting results within a week after the EID test	63%	5%	3%	20%	9%
4.	EID client / parent taking the child for the test within the past 4 weeks	12%	7%	30%	13%	38%
5.	Infant receiving cotrimoxazole drugs for the past 7 days to date	48%	2%	4%	16%	30%
6.	Whether Infant HIV test results were received in time	7%	20%	18%	10%	45%

Source: Research Survey data (Rwechungura, 2016)

4.4 Regression Results

The Regression Analysis was used in establishing the relationship between dependent and independent variables. The study model linking utilisation of EID services and independent variables was given by: $U = \alpha_1 H + \alpha_2 M + \alpha_3 S$, where U is utilisation of EID services; α_1 , α_2 , α_3 and α_4 are coefficients of competence of healthcare worker (H), availability of EID material (M) and availability of sample and results

transportation system (S). The criteria for measuring the relationship were statistical significance value known as t-value. Thus, the condition used in testing level of significance was the t-value that is given by $t \geq 2$. Thus, the variable is statistically significant if $t \geq 2$ where t is the coefficient of the independent variable given by regression analysis results.

Table 4.6: Regression Results of the Health Facility Factor Coefficients

Coefficients (a)						
L	Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-.015	.043		-3.347	.000
	Health Worker	-.029	.043	-.027	-4.691	.000
	Material	1.031	.081	1.000	12.655	.000
	Sample	.024	.091	.022	2.266	.000

a Dependent Variable: EID_Utilisation

4.4.1 Hypothesis One Testing: Availability of competent healthcare workers

H10: Null Hypothesis: Availability of competent healthcare workers at Kilolo health facility has no effect on utilisation of EID services.

H1A: Alternative Hypothesis: Availability of competent healthcare workers at Kilolo health facility positively influences utilisation of EID services.

Furthermore, as shown in Table 4.6, the value of t being greater than 2 shows that availability of competent healthcare workers is statistically significant in utilisation of EID services. As shown in Table 4.6 (column B) the coefficient for healthcare worker is -0.29, this implied that the availability of competent healthcare worker has a negative influence to the utilisation of EID services at the health facility.

4.4.2 Hypothesis Two Testing: Availability of EID materials

H20: Null Hypothesis: Availability of EID materials at Kilolo health facility has no effect on utilisation of EID services.

H2A: Alternative Hypothesis: Availability of EID materials at Kilolo health facility positively influences utilisation of EID services.

In Table 4.6, *Health Worker* refers to availability of competent healthcare worker; *Material* refers to availability of EID materials and *Sample* refers to availability of sample and results transportation system. The values for the variable *Health Worker* were obtained by averaging the values for responses under healthcare worker on competence of healthcare workers on EID services. The values for *Material* were obtained by averaging the values for responses under healthcare worker on availability of EID materials. The values for *Sample* were obtained by averaging the responses under healthcare worker on availability of sample and results transportation system. The data for the three variables with reference to utilisation of EID services as the dependent variable were run using SPSS data analysis programme.

As indicated in Table 4.6, availability of EID services is statistically significant since $t > 2$. The p-value, in the last column (i.e. level of significance) is zero. For a variable to be statistically significant the p-value should be in the range: $0 \leq p \leq 0.05$. The less the value of p the higher the statistically significant the variable is which suggests that changes in availability of EID materials at health facility are associated with changes in the utilisation of EID services at the health facility.

From Table 4.6, with the values of p being zero in all cases, the null hypothesis was rejected. This implied accepting the alternative hypothesis. Hence, availability of EID materials at Kilolo health facility positively influenced utilisation of EID services.

4.4.2 Hypothesis Three Testing: Sample and Results transportation system

H30: Null Hypothesis: Availability of sample and results transportation system at health facility has no effect on utilisation of EID services.

H3A: Alternative Hypothesis: Availability of sample and results transportation system at Kilolo health facility positively influences utilisation of EID services.

As shown in Table 4.6, availability of sample and results transportation system was statistically significant since $t > 2$.

This implied acceptance of the alternative hypothesis. Hence, availability of sample and results transportation system at Kilolo health facility positively influences utilisation of EID services.

4.5 Summary on Influence of Health Facility Factors on EID Services

4.5.1 Analysis of the Research Model from Regression Results

The study model linking utilisation of EID services and independent variables was given by: $U = \alpha_1 H + \alpha_2 M + \alpha_3 S$, where U is utilisation of EID services; α_1 , α_2 , α_3 and α_4 are coefficients of competence of healthcare worker (H), availability of EID material (M) and availability of sample and results transportation system (S). By inserting the coefficients from Table 4.7 (column B), the equation becomes: $U = -0.029H + 1.031M + 0.024S$. From the equation obtained from the regression analysis, it is clear that the availability of sample and results transportation system (S) and EID material (M) had a positive correlation to the utilisation of EID services at the health facilities; while the competence of healthcare worker had a negative influence to the utilisation of EID services at the health facility.

Any positive change in availability of sample and results transportation system and availability of EID materials will imply a positive change in the utilisation of EID services. This proves the validity of the two hypotheses. However, the coefficient for competence of healthcare worker is negative; this implies that this variable has a negative influence to the utilisation of EID services. In other words, any negative change in the competence of healthcare worker has a negative influence in the utilisation of EID services.

4.5.2 Influence of Health Facility Factors on EID Services basing on ANOVA value

As shown in Table 4.7, the level of significance for the analysis of variance model is 0.000. This level of significance implies that there is statistical relationship (i.e. health facility factors have a positive influence to the utilisation of EID services). Furthermore, as reported in the study carried out by Montgomery (2001), large F-value (that is large test statistic) indicates statistically significant results.

The study carried out by Montgomery (2001) showed that F-value of 7 is the minimum value above which null hypotheses are rejected. In Table 4.7, it is shown that ANOVA analysis results give F-value of 4355.905. Thus, there is a positive influence of EID materials and sample and results transportation system on the utilisation of EID services at the health facilities.

Table 4.7: Indication of the Influence basing on the ANOVA Value

ANOVA(b)					
Model		Sum of Squares	df	Mean Square	F
1	Regression	208.332	3	69.444	4355.905
	Residual	1.530	96	.016	
	Total	209.862	99		

a Predictors: (Constant), Sample, Health_Worker, Material

b Dependent Variable: EID_Utilisation

4.5.3 Factors related to satisfaction of the clients with EID Services

From the results obtained in this study, it is realised that there are several reasons that hinder mothers / guardians from attending the HIV testing services for their HIV exposed infants. Observations and interviews have indicated that most of the clients (especially HIV positive mothers do not enrol their newly born infants immediately after birth; there is some sought of delay for most of the mothers. It was realised that some of HIV positive mothers do not take their HEI infants for being diagnosed and hence could not realise whether infants are HIV positive or not. Hence, mothers or guardians delay in initiating their infants with ARV prophylaxis drugs as soon as possible and in some cases they do not initiate at all leading infant morbidity and mortality. For instance, during interviews with mothers of some of the HIV infants it was realised that some mothers did not attend EID services within the first 4 weeks after the child's birth and instead attended the EID services later than 4 weeks after birth. This is may be partly due to the fact that such mothers either do not see the relevance of the EID services or they are not satisfied with the quality of the EID services offered.

What was observed in this study was similar to the observation in the study conducted by Kisika (2015) on perception, where the PMTCT clients complained on the inefficiency of the PMTCT services like receiving services late, not getting some of the services like CD4 count test and getting partial information from the health providers and sometimes the concerns of the clients were not addressed.

In this study, results showed that some mothers / guardians did not follow up the results of their infant HIV test. This is partly psychological where parents / guardians were not at ease in the community when their children were known to have HIV infection. This tendency or behaviour in parents increased infant morbidity and mortality in the sense that if the child HIV status is not earlier identified then the infant will suffer more diseases related to HIV infection due to the fact that he / she does not take any drugs to reduce the intensity / gravity of weaknesses introduced by the HIV infection in his / her body.

As far as laziness of the healthcare providers is concerned, the problem was that some of the health providers do not educate mothers / guardians on following up of HIV test results. This leads to clients getting results sometimes one month after HIV test; although this partly was caused by the weaknesses in sample and results transportation system. The results showed that sometimes results are provided within a week. This showed the good efficiency in results transport system for some of the health facilities. It was realised that some infants did not receive cotrimoxazole drugs for the past 7 days up to the date of the enquiry and they had already been initiated with HIV treatment services in which case they were supposed to take the drugs daily. This showed that some infants are given drugs while their mothers or guardians do not give such drugs to them or they give them at intervals not recommended by the healthcare provider. Besides interviews and questionnaires, other data was obtained from documentary reviews. It was realised that among the causes of the major factors affecting the level of satisfaction include the inputs in the programme which involve material resources with a focus on availability of organisational attributes which include guidelines and protocols, registers, supervision and waiting time. Theoretically, inputs are essential in shaping or transforming or making things happen, hence, delivery of effective and acceptable services depend on availability of inputs.

4.5.4 Main Shortcomings affecting Utilisation of EID Services

During observation and interviews it was realised that the following are the main shortcomings affecting the utilisation of the EID programme:

- (i) Inadequate EID materials including RCH cards, CTC cards, job aids, DBS materials, cotrimoxazole drugs and ARV prophylaxis drugs at health facilities
- (ii) Lack of efficiency in the sample and drugs transportation system (sometimes such systems do not operate as planned due to health workers' laziness and financial deficiencies). Also, lack of schedules on sample and results transportation systems reduces the efficiency and reliability of sample and results transportation system;
- (iii) Lack of technical competence of the healthcare providers in providing EID services. The observations and interviews with healthcare providers indicated that the following are main challenges in Healthcare Workers as far as providing EID services were concerned:
 - Lack of awareness for most of them in EID policies and guidelines;
 - Inadequate counselling skills to HIV positive pregnant mothers;
 - Weak participation in enrolling HIV infants to HIV test services (EID services);
 - Inappropriate interaction with clients coming for clinic services at the health facilities (e.g. RCH clinic, PMTCT and EID services);

4.6 Findings on Reliability Analysis of the Study Instrument

To ensure consistency or measurement of the collected data Likert Scale was used to measure data from strongly disagree to strongly agree. Such decision was made due to the fact that when analysis is to be done by regression there is a need of assigning values by 1 for strongly disagree towards strongly agree in ascending order. Assigning values from 1 for strongly agree towards strongly disagree may lead to wrong interpretation of study findings. The statistical Package for Social Sciences (SPSS) was used to compute Cronbach's Alpha. Cronbach's Alpha was computed to assess the internal consistency of the component scales. Using SPSS Cronbach's Alphas were obtained for all variable items.

Cronbach's alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. It should also be noted that a high value for Cronbach's alpha indicates good internal consistency of the items in the scale (Gliem & Rosemary, 2003). From reliability analysis results various Cronbach's alphas were obtained as shown in Table 4.8 Cronbach's Alpha Values ranged from 0.971 to 0.947

Table 4.8: Summary of Reliability Analysis for Independent Variables (Health Facility Factors)

Variable	Number of Questions	Cronbach's
Competence of Healthcare worker	6	.971
Availability of EID materials	7	.974
Availability of sample and results transportation system	5	.947

Source: Researcher Survey data

Likewise, Table 4.9 shows the Cronbach Alpha for utilisation of EID services. The Cronbach alpha for utilisation of EID services was 0.977. This result is in line with the benchmark that an instrument with the coefficient of 0.70 or above has a high reliability standard (Sekaran & Bougie, 2010).

Table 4.9: Reliability Analysis for Utilisation of EID Services

Variable	Number of Questions	Cronbach's Alpha
Utilisation of EID services at health facilities	7	.977

4.6.1 Detailed Reliability Analysis for each Study Variable

(i) Competence of Healthcare workers

Alpha if Item Deleted is the most important column in reliability analysis. This represents the scale's Cronbach's alpha reliability coefficient for internal consistency if the individual item is removed from the scale. For instance, in Table 4.9, the scale's Cronbach's alpha for reliability of healthcare workers (if question 2 is deleted) it would be decreased from 0.971 to 0.965. The deletion is not recommended since it reduces the reliability of the study scale.

Table 4.9: Reliability Analysis for Competence of Healthcare Worker

S/N	Reliability Question / Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	Knowledge and skills in providing EID services	17.47	45.888	.773	.978
2.	Awareness on EID policies and guidelines	17.09	43.315	.903	.965
3.	Skills and awareness on HIV clients counselling	15.67	42.789	.917	.964
4.	Participated in enrolling infants to EID services	15.82	42.957	.956	.960
5.	Advised mothers/guardians to come for results	15.95	41.038	.932	.963
6.	Checks HIV status for infants enrolled at the RCH Clinic	15.80	42.788	.952	.960

Source: Researcher Survey data

(ii) Reliability Analysis for Availability of EID materials

As far as this variable is concerned it was observed that removing questions 3 reduced EID materials Cronbach's alpha from 0.974 to 0.971 (as shown in Table 4.10), such deletion is not recommended since it causes decrease in reliability score. Cronbach's alpha are shown in Table 4.10 in case any of the questions is deleted.

Table 4.10: Reliability Analysis for EID materials

S/N	Reliability Question / Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	Has sufficient RCH cards	17.93	75.237	.827	.975
2.	The health facility has EID job cards	16.89	67.473	.965	.965
3.	The EID job cards are being used at the health facility	16.24	74.346	.894	.971
4.	The facility has adequate DBS materials	17.34	67.863	.947	.967
5.	Cotrimoxazole drugs are available all the time	17.35	72.250	.965	.966
6.	Sometimes there no EID materials at the health facility	16.14	73.516	.822	.975
7.	ARV prophylaxis drugs are available all the time	17.57	73.642	.939	.968

Source: Researcher Survey data

(iii) Availability of Sample and Results Transportation System

As shown in Table 4.11, the Cronbach's alpha for reliability of sample and results transportation system was reduced from 0.947 to 0.943 when question 3 was deleted. This shows that all the questions were relevant to achieve reliability of the study.

Table 4.11: Availability of Sample and Results Transportation System

S/N	Reliability Question / Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	Sample and results transportation system available	11.11	29.957	.831	.939
2.	Transportation system works as planned	12.56	29.804	.933	.923
3.	DBS sample and results transported on weekly basis	12.81	29.711	.810	.943
4.	The transportation system is reliable	12.31	26.256	.915	.926
5.	EID transportation schedules available	10.93	31.864	.819	.942

Source: Researcher Survey data

(iv) Cronbach's Alpha for Utilisation of EID Services at the Health Facility

The overall Cronbach's alpha for utilisation of EID services as shown in Table 4.13 was 0.977. Deleting questions 1 reduced the Cronbach's alpha from 0.977 to 0.970. as shown in Table 4.12

Table 4.12: Overall Cronbach's Alpha for Utilisation of EID Services

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.977	.978	7

Source: Researcher Survey data

The difference is minor however; such a deletion of a question reduced reliability of the study instrument. Further deletion of questions resulted to further decrease of the Cronbach's alpha. Those being the case all questions were retained to improve reliability of the study instrument.

Table 4.13: Reliability Analysis for Utilisation of EID Services

S/N	Reliability Item	Question /	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	Exposed Infant attended EID Services within 3 weeks after birth		17.62	76.844	.967	.970
2.	Followed up EID results for HIV exposed infant		17.93	75.864	.920	.973
3.	Got the EID service results within a week after the HIV test		18.19	78.903	.844	.978
4.	HIV EID results showed that Infant was HIV positive		17.06	74.400	.930	.973
5.	Brought the Child for HIV test during the past 4 weeks		16.68	79.715	.909	.974
6.	Infant received cotrimoxazole drugs during the past 7 days		17.48	71.303	.957	.971
7.	EID results received during the date provided by the healthcare provider		16.60	79.192	.911	.974

Source: Researcher Survey data

4.6.2 Summary on Reliability Analysis of the Study Variables

In this section the reliability analysis of the study variables using Cronbach's Alpha has shown that if any of the questions from any of the study variables are omitted the value of the Cronbach's Alpha reduces to a lower value. This was the indication that all the questions were relevant to be included to the assessment of the Early Infant Diagnosis of HIV infection for health facilities in Kilolo District.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings of the study by summarising responses to each of the evaluation questions. The responses are discussed accordingly basing on the evaluation results provided in chapter four. The main responses on the findings cover the assessment of the competences of the healthcare workers, the availability of EID materials, the utilisation of EID materials and the availability of sample and results transportation system. Furthermore, elaborates on the reliability of the study instruments (in this case 5 point Likert scale questionnaires) by using Cronbach's Alpha values obtained from SPSS simulation results.

This section reveals that there was a good quality in terms of consistency in the study instruments (questionnaires). The study was designed in such a way that it was reliable for similar repeated researches. The design was such that if the researcher repeats the study it will in no doubt produce the same results (Kothari, 2004). In this section therefore, reliability analysis of the study variables using Cronbach's Alpha has shown that if any of the questions from any of the study variables are omitted the value of the Cronbach's Alpha reduces to a lower value. This was the indication that all the questions were relevant to be included to the assessment of the Early Infant Diagnosis of HIV infection for health facilities in Kilolo District.

5.2 Response to Evaluation Question

In the effort to assess the influence of health facility factors on utilisation of EID services in Kilolo District Council, the author raised a number of evaluation questions which were in line with the identified evaluation objectives. This section elaborates on the responses to such evaluation questions. Hence, from documentary reviews, observations and structured questionnaires the responses to evaluations questions for this study were been obtained.

5.2.1 Evaluation Question I

The first evaluation question was *“what is the extent of the availability of EID materials and their influence on utilisation of EID services at Kilolo health facilities?”*

As shown in chapter four, the study results have indicated that availability of EID materials positively influences utilisation of EID services at health facilities. Furthermore, as shown in Figure 4.1, the 4 highest bars summarise major observations on the opinions of healthcare workers on availability of EID materials at health facilities; Sixty one percent (61%) of the respondents reported that there are inadequate RCH cards, this shows that some of the clients are not registered in RCH registers and make it difficult to transfer HIV exposed infants to the EID programme at the health facility. Moreover, thirty percent (30%) of the respondents reported that there are no adequate EID job aids; which showed that health facility workers may not perform well EID services due to missing job guidance. Forty eight percent (48%) of the respondents reported that there are inadequate DBS materials and hence making HIV testing of infants not possible for some days. It can thus be deduced that availability of EID materials is poor in the health facilities hence affecting the performance of healthcare personnel.

5.2.2 Evaluation Question II

The second evaluation question was *“what is the extent of the availability of sample and result transportation system and its influence on utilisation of EID services at Kilolo health facilities?”* Availability and reliability of the sample and results transportation system at health facilities was assessed basing on the observation and opinions obtained from the health workers. The study results showed that availability of sample and results transportation system positively influences EID services at health facilities.

The assessment checklist consisted of: (i) Sample and results transportation system being in place (ii) Sample and results transportation system operating as planned (iii) DBS sample and results transported on weekly basis (iv) whether sample and results transportation system is reliable and (v) whether there are schedules on sample and results transportation systems at the health facility. Fifty five percent (55%) of the

respondents reported that the sample and results transportation system is available in health facilities, although twenty four percent (24%) of the healthcare workers reported that the sample and results transportation system are not available. That implied that the respondents were from different health facilities.

Regarding the enquiry on whether DBS sample and results are transported on weekly basis sixty percent (60%) of the healthcare workers reported that such DBS results are not transported on weekly bases. This implied that in case the rule for transporting DBS sample and results is on weekly bases then such DBS sample and results are delayed which reduces the efficiency of the EID services at the health facilities. From the observations and through interviews with healthcare workers it was realised that fifty seven percent (57%) of the healthcare workers reported that there are schedule on sample and results transportation systems. This shows that some of the health facilities operate basing on the regulations and policies of health authorities including the policies and guidelines from the Ministry of Health and Social Welfare.

Evaluation Question III

The third evaluation question was “To what extent are healthcare workers competent in carrying out EID services and their influence on utilisation of EID services at Kilolo health facilities?” Using regression analysis the results showed that competence of healthcare workers negatively influences EID services. This implied that utilisation of EID services is not necessarily increased by positive changes in competence of healthcare workers involved in EID services. This further implied that there are other factors besides the competence of healthcare workers that would increase utilisation of EID services. This result is contrary to the study assumption probably some of the healthcare workers could not understand clearly the questions.

5.2.3 Evaluation Question IV

The fourth evaluation question was “*To what extent are mothers / guardians of HIV exposed infants satisfied with EID services provided in Kilolo health facilities?*” Fifty two percent (52%) of the EID clients had the response of strongly disagree to the question, when they were asked to provide their level of agreement regarding the question on whether they follow up the EID results of their HIV exposed infants.

Not following up infant HIV test results may be partly due to the fact that they are not satisfied with the EID services offered at the health facilities in the sense that they are discouraged by the healthcare workers or they do not find the usefulness of the EID services. That being the case they decide not to use such services and this affects the utilisation of EID services at the health facilities.

The other factor affecting the level of satisfaction was the availability of cotrimoxazole drug. Forty eight percent (48%)of the clients (mothers / guardians) reported that for the period of 7 days to the day of the enquiry they were not receiving cotrimoxazole drugs for the HIV infected infants enrolled in EID services at the health facility. This would be partly due to the lack of drugs at the health facility or to the laziness of the clients in following up for the drugs. This situation reduces the level of satisfaction of the client as far as the EID services are concerned. Hence, not taking the drugs in the intervals recommended by the healthcare provider reduces the utilisation of EID services.

There are variations as far as taking cotrimoxazole drugs was concerned. For instance, thirty percent (30%) of the clients (mothers / guardians) reported that during the past 7 days to the date of the enquiry they were receiving cotrimoxazole drugs. This level of agreement with the indicator shows that such clients have met with competent healthcare workers in such a way that they realised the significance of taking drugs in the time intervals recommended by the healthcare providers. Hence, adhering to the procedures and guidelines / instructions regarding EID services improves satisfaction / acceptance and hence improves utilisation of EID services by the clients.

It was well observed during enquiries that forty five percent (45%) of the clients received the EID results during the appointment date. This shows that such clients are satisfied with the EID services and they have realised that it reduces morbidity of their HIV infected infants and hence reduces the rate of infant HIV related mortality rates. However, the percentage is very small as intended by the programme. If the utilisation of the services could be optimal we expect more than ninety five percent (95%) of the clients should have received the test results on the appointment date. From the identified observations during enquiries, it was found that there was inadequate utilisation of the EID services due to the fact that mothers / guardians are not satisfied

with the EID services due to the mentioned factors. This sums up the response to the fourth evaluation question “*To what extent are mothers / guardians of HIV exposed infants satisfied with EID services provided in health facilities?*”

CHAPTER SIX

SUMMARY, CONCLUSIONS AND IMPLICATIONS

6.1 Introduction

This chapter summarises on the problem statement and evaluation objectives. The chapter further summarises on the study findings. This is followed by the conclusions on theoretical frameworks, policy implications, limitations and evaluation recommendations.

6.2 Summary on Problem Statement and Evaluation Objectives

6.2.1 Problem Statement

The study problem was that there are Early Infant Diagnosis Programmes of HIV infection in Tanzania, however, the programme is not being utilised fully and that the reasons leading to its failure or inefficiency are partly due to shortcomings in the acceptance of the EID programme by the mothers / guardians of the HIV exposed infants and partly due to the inefficiencies in the related health facility factors mainly the competence of the healthcare worker, the availability of sample and results transportation system and the availability of EID materials. However, such were the opinions raised by the author from experience as medical professional, hence the author decided to carry out the study to assess the influence of health facility factors on utilisation of EID services.

6.2.2 Evaluation Objectives

- (i) The influence of availability of EID materials on utilisation of EID services was obtained and assessment on the availability of EID materials was done at length basing on available questions;
- (ii) The influence of sample and results transportation system on utilisation of EID services was determined using regression analysis and assessment of the sample and results transportation system has been done basing 5 point Likert scale questions;

- (iii) Furthermore, the influence of competent healthcare worker on utilisation of EID services was also determined as presented in Chapter 4 and Chapter 5 respectively;
- (iv) Finally, assessment of the client satisfaction with EID services has been presented in Chapter 4 and elaborated further in Chapter 5; the utilisation of early infant diagnosis of HIV Infection was well assessed in which case the client's level of satisfaction with EID services was established and measured using the 5 point levels of Likert scale and the application of the SPSS programme.

6.3 Study Findings

The evaluations of the health facility factors and utilisation of the EID services have revealed that there are inadequate EID materials and ineffective sample and results transportation system in Kilolo health facilities. Furthermore, there is lack of skills in healthcare workers. The study has revealed that the HIV exposed infants are taken for the HIV test longer period after birth which is against the EID programme policies and guidelines.

During interviews with clients it was realised that there are HIV infant related morbidity and mortality due to the fact that there is no early initiation of Antiretroviral Therapy (ART) to the HIV positive infants. Hence, infants are not enrolled in the HIV positive infant treatment programmes. Thus, most of the HIV Exposed Infants (HEI) in Kilolo District Council are not identified and hence are not linked to Deoxyribonucleic Acid (DNA) Polymerase Chain Reaction (PCR) testing, since their final HIV status determination is not known for most of the infants.

6.4 Conclusions on Theoretical Frameworks

During measuring utilisation of EID services the Donabedian theoretical framework for measuring quality in healthcare services was used. According to Donabedian, measuring quality has to ascertain what is being done and what was supposed to be done as a blaming procedure (De Greyndt, 1995). That being the case, the author designed questions for measuring what is supposed to be done against what was being done in the selected Kilolo health facilities.

With Donadedian (1988) conceptual framework for measuring quality of care there are three components, that is, structure (inputs), process (activities) and outcome (results). This approach is widely used to assess healthcare services and hence suitable for measuring the utilisation of EID services provided in Kilolo health facilities.

6.5 Policy implications

The findings of this study and their related recommendations will be used for planning, decision making, resources allocation at all levels and re- orientation of the EID programme. Furthermore, this study has a great implication to healthcare workers, mothers / guardians of the HIV exposed infants, students in the field of health monitoring and evaluations and other practitioners in HIV prevention and treatment field.

6.6 Limitations

This study had time and budget constraints; it was conducted only in Kilolo District, larger population in Tanzania would have been used for getting large scale information through survey and hence assess the utilisation of EID services on the national level.

6.7 Evaluation recommendations

The author recommends the following for being able to implement effectively the EID programme in Tanzania:

- (i) Counselling HIV positive mothers on reporting their HIV exposed infants for being enrolled in the EID programme
- (ii) Providing short and long term training to healthcare workers on EID services
- (iii) Ensuring that the health facility has EID materials all the time
- (iv) Paying the healthcare workers good salaries and giving them opportunities for work life balance

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APPENDICES

APPENDIX I: Questionnaire to assess Early Infant Diagnosis for HIV infection and the associated Health Facility Factors in Kilolo District Council

Dear Respondent,

May you assist in responding to this enquiry as a part of the requirements for the award of the Master Degree of Monitoring and Evaluation (HME) of Mzumbe University. The information you provide will basically assist in improving utilisation of Early Infant Diagnosis of HIV infection in Kilolo District Council and thereby reducing HIV related infant mortalities in Kilolo District. Due to research ethics your identity will not be disclosed. This enquiry consists of appendix A, appendix B, appendix C.

Date of enquiry.....

Health Facility providing the EID Services

This questionnaire consists of 31 Questions, for each question put a tick to one option (in a relevant number of your choice or the appropriate box of the column of the available Likert scale 5 point options.

A: BACKGROUND INFORMATION PROVIDED BY MOTHER /GUARDIAN

1. Level of the facility providing EID services
 - i. Hospital
 - ii. Health centre
 - iii. Dispensary

2. Relationship of Respondent with the infant
 - i. Mother
 - ii. Father
 - iii. Guardian

3. Age of Respondent

- i. Below 20 years
- ii. 20-40 years
- iii. 41-50 years
- iv. Above 50 years

4. Level of education of Respondent (Mother / Guardian)

- i. No formal education
- ii. Primary education
- iii. Secondary education
- iv. College education
- v. Degree and above

5. Occupation of the Respondent (Mother / Guardian)

- i. Employed
- ii. Own Business
- iii. Dependent

6. Marital status of the Respondent (Mother / Guardian)

- i. Single
- ii. Married
- iii. Cohabiting

**B: ASSESSING THE UTILISATION OF EID SERVICES AT THE
HEALTH FACILITY (RESPONSES PROVIDED BY MOTHER / GUARDIAN)**

S/N	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	Within the first four weeks after birth has your HIV exposed infant attended EID services?					
2.	Did you follow up the EID results of your HIV exposed infant?					
3.	Did you get the test results within a week after the EID test?					
4.	For the past 4 weeks to-date have you brought your child for EID services?					
5.	For the past 7 days to date has your child received cotrimoxazole drugs?					
6.	For the previous HIV test of your infant did you receive the EID test results during the date given by the healthcare provider?					

C: ASSESSING THE EFFECTIVENESS OF HEALTH FACILITY FACTORS

C-I: Assessing Healthcare Workers in carrying out EID Services

S/N	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
7.	Do you have enough knowledge and skills as Healthcare worker in performing EID services?					
8.	Are you aware with the policies and guidelines for performing EID services?					
9.	Are you familiar with counselling pregnant mothers for testing their HIV status?					
10.	For the past 6 months to date have you played a part in enrolling HIV exposed infants to EID programme?					
11.	Do you advise parents / guardians when to come for EID results?					
12.	Do you check HIV exposure status for infants enrolled at your RCH clinic?					

C-II: Assessing Availability of EID Material at the Health Facility

S/N	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
8.	Do you have sufficient RCH cards at your Health Facility?					
9.	Do you have EID job aids (e.g. guidelines and posters) at your health facility?					
10.	Are the available job aids in use?					
11.	Are there adequate DBS materials at your health facility?					
12.	Do you have all the time cotrimoxazole drugs at your health facility?					
13.	Do you sometime run out of stock of EID materials at your health facility?					
14.	Do you have all the time ARV prophylaxis drugs for HIV positive infants at your health facility?					

C-III: Assessing the Sample and Results Transportation System

S/N	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
6.	Do you have sample and results transportation system at your health facility?					
7.	Is your sample and results transportation system operating on regular intervals as planned by the health facility?					
8.	Is DBS sample and results transported on weekly basis at your health facility?					
9.	Are your sample and results transportation system means reliable?					
10.	Do you have schedule on sample and results transportation systems?					

**APPENDIX II: QUESTIONNAIRE (SWAHILI VERSION) CHUO KIKUU
MZUMBE**

**ASSESSMENT OF EARLY INFANT DIAGNOSIS FOR HIV INFECTION AND
THE ASSOCIATED HEALTH FACILITY FACTORS IN KILOLO DISTRICT
COUNCIL**

A: TAATIFA ZA MSIMAMIZI (MAMA/BABA/MLEZI)

1. Jina la kituo
2. Ngazi ya kituo
 - i. Hospitali
 - ii. Kituo cha Afya
 - iii. Zahanati
3. Uhusiano na mtoto
 - i. Mama
 - ii. Baba
 - iii. Mlezi
4. Umri wa msimamizi (mama/baba/mlezi)
 - i. Below 20 years
 - ii. 20-40 years
 - iii. 41-50 years
 - iv. Above 50 years
6. Kiwango cha elimu ya mama/baba/mlezi
 - i. Hajapata elimu
 - ii. Elimu ya msingi
 - iii. Amemaliza elimu ya msingi
 - iv. Elimu ya sekondari
 - v. Elimu ya stahada
 - vi. Elimu ya shahada au zaidi

7. Kazi ya msimamizi (mama/baba/ mlezi)

- i. Mwajiriwa
- ii. Anafanya kazi binafsi
- iii. Mtegemezi

8. Hali ya ndoa

- i. Hajaolewa/ hajaoa
- ii. Ameolewa/ameoa
- iii. Anaishi na mwanaume/mwanamke bila ndoa

**B: KUTATHMINI MATUMIZI YA HUDUMA YA KUPIMA UKIMWI
KWA WATOTO AMBAO MAMA ZAO NI WAATHIRIKA WA UKIMWI**

S/N	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	Within the first three weeks after birth has your HIV exposed infant attended EID services?					
2.	Did you follow up the EID results of your HIV exposed infant?					
3.	Did you get the test results within a week after the EID test?					
4.	Was the HIV status after EID test found positive?					
5.	For the past 4 weeks to-date have you brought your child for EID services?					
6.	For the past 7 days to date has your child received cotrimoxazole drugs?					
7.	For the previous HIV test of your infant – did you not receive the test results due to delay of results in previous visits?					

C: KUTATHMINI UWEZO WA HUDUMA ZA AFYA KATIKA KUPIMA UKIMWI KWA WATOTO WADOGO AMBAO MAMA ZAO NI WAATHIRIKA WA UKIMWI

C-I: Kutathmini uwezo wa wahudumu wa afya katika kupima ukimwi kwa watoto wadogo waliozaliwa na wazazi wenye ukimwi

S/N	Swali	Nakataa kabisa	Nakataa	Sijui	Nakubali	Nakubali kabisa
1.	Una elimu ya kutosha juu ya kuendesha shughuri za upimaji wa watoto waliozaliwa na Mama wenye ukimwi?					
2.	Unajua taratibu za upimaji ukimwi kwa watoto wadogo?					
3.	Una uzoefu wa kuwashauri watu kabla ya kupima ukimwi?					
4.	Kwa kipindi cha miezi 6 iliyopita umeshiriki kuwaingiza watoto katika mpango wa kupima ukimwi?					
5.	Uwa unawashauri wazazi walete watoto wao kupima ukimwi?					
6.	Je uwa unaangalia kama mtoto aliyeletwa kliniki kama ana ukimwi au la?					

C-II: Kutathmini ubora wa vitendea kazi katika huduma ya upijmaji wa Ukimwi

S/N	Swali	Nakataa kabisa	Nakataa	Sijui	Nakubali	Nakubali kabisa
1.	Kuna RCH kadi za kutosha?					
2.	Una vielekezi vya kukusaidia kufanya kazi (e.g. taratibu, mabango, n.k)?					
3.	Je ivyo vielekezi unavitumia au vipo kama mapambo tu?					
4.	Una vifaa vya kutosha vya kupima damu kwa watoto wadogo?					
5.	Je muda wote yaani kila siku una vidonge vya cotrimoxazole?					
6.	Je kuna wakati vifaa vya kupima ukimwi kwa watoto wadogo uwa vinaisha?					
7.	Je muda wote uwa mda vidonge vya ARV prophylaxis hapa hospitalini?					

C-III: Kutathmini mfumo wa usafirishaji wa specimen na matokeo ya vipimo

S/N	Swali	Nakataa kabisa	Nakataa	Sijui	Nakubali	Nakubali kabisa
1.	Hapa hospitalini mna mfumo wa usafirishaji wa specimen na matokeo ya vipimo?					
2.	Je mna muda maalumu wa kusafirisha specimen and matokeo ya vipimo kama ilivyopangwa na hospitali?					
3.	Je specimen na matokeo ya vipimo vya damu kwa watoto wanaopimwa ukimwi vinasafirishwa kila wiki?					
4.	Je mna uhakika kuwa specimen na matokeo ya vipimo vinawafikia walengwa?					
5.	Je mna taratibu na kanuni za kusafirisha specimen na matokeo ya vipimo nya ukimwi?					

APPENDIX II: SPSS SIMULATION RESULTS

Frequency Table

Level of Facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hospital	10	10.0	10.0	10.0
	Health centre	20	20.0	20.0	30.0
	Dispensary	70	70.0	70.0	100.0
	Total	100	100.0	100.0	

Relationship of Respondent with the infant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mother	53	53.0	53.0	53.0
	Father	9	9.0	9.0	62.0
	Guardian	38	38.0	38.0	100.0
	Total	100	100.0	100.0	

Age of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15 - 20 years	7	7.0	7.0	7.0
	20 - 40 years	25	25.0	25.0	32.0
	41 - 50 years	50	50.0	50.0	82.0
	Above 50 years	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

Level of education of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	9	9.0	9.0	9.0
	Primary education	31	31.0	31.0	40.0
	Secondary education	45	45.0	45.0	85.0
	College education	8	8.0	8.0	93.0
	Degree and above	7	7.0	7.0	100.0
	Total	100	100.0	100.0	

Occupation of the Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	25	25.0	25.0	25.0
	Own Business	28	28.0	28.0	53.0
	Dependant	47	47.0	47.0	100.0
	Total	100	100.0	100.0	

Marital Status of the Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	12	12.0	12.0	12.0
	Married	51	51.0	51.0	63.0
	Cohabiting	37	37.0	37.0	100.0
	Total	100	100.0	100.0	

Exposed Infant attended EID Services within 3 weeks after birth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	36	36.0	36.0	36.0
	Disagree	10	10.0	10.0	46.0
	Neither agree nor disagree	21	21.0	21.0	67.0
	Agree	20	20.0	20.0	87.0
	Strongly agree	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

Followed up EID results for HIV exposed infant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	52	52.0	52.0	52.0
	Disagree	7	7.0	7.0	59.0
	Neither agree nor disagree	15	15.0	15.0	74.0
	Agree	8	8.0	8.0	82.0
	Strongly agree	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

Got the EID service results within a week after the HIV test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	63	63.0	63.0	63.0
	Disagree	5	5.0	5.0	68.0
	Neither agree nor disagree	3	3.0	3.0	71.0
	Agree	20	20.0	20.0	91.0
	Strongly agree	9	9.0	9.0	100.0
	Total	100	100.0	100.0	

HIV EID results showed that Infant was HIV positive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	29	29.0	29.0	29.0
	Disagree	10	10.0	10.0	39.0
	Neither agree nor disagree	5	5.0	5.0	44.0
	Agree	24	24.0	24.0	68.0
	Strongly agree	32	32.0	32.0	100.0
	Total	100	100.0	100.0	

Brought the Child for HIV test during the past 4 weeks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	12	12.0	12.0	12.0
	Disagree	7	7.0	7.0	19.0
	Neither agree nor disagree	30	30.0	30.0	49.0
	Agree	13	13.0	13.0	62.0
	Strongly agree	38	38.0	38.0	100.0
	Total	100	100.0	100.0	

Infant received cotrimoxazole drugs during the past 7 days

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	48	48.0	48.0	48.0
	Disagree	2	2.0	2.0	50.0
	Neither agree nor disagree	4	4.0	4.0	54.0
	Agree	16	16.0	16.0	70.0
	Strongly agree	30	30.0	30.0	100.0
	Total	100	100.0	100.0	

EID results received during the date provided by the healthcare provider

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	7.0	7.0	7.0
	Disagree	20	20.0	20.0	27.0
	Neither agree nor disagree	18	18.0	18.0	45.0
	Agree	10	10.0	10.0	55.0
	Strongly agree	45	45.0	45.0	100.0
	Total	100	100.0	100.0	

Has sufficient RCH cards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	61	61.0	61.0	61.0
	Disagree	12	12.0	12.0	73.0
	Neither agree nor disagree	3	3.0	3.0	76.0
	Agree	16	16.0	16.0	92.0
	Strongly agree	8	8.0	8.0	100.0
	Total	100	100.0	100.0	

The health facility has EID job cards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	30	30.0	30.0	30.0
	Disagree	17	17.0	17.0	47.0
	Neither agree nor disagree	12	12.0	12.0	59.0
	Agree	3	3.0	3.0	62.0
	Strongly agree	38	38.0	38.0	100.0
	Total	100	100.0	100.0	

The EID job cards are being used at the health facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	12	12.0	12.0	12.0
	Disagree	7	7.0	7.0	19.0
	Neither agree nor disagree	24	24.0	24.0	43.0
	Agree	16	16.0	16.0	59.0
	Strongly agree	41	41.0	41.0	100.0
	Total	100	100.0	100.0	

The facility has adequate DBS materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	48	48.0	48.0	48.0
	Disagree	7	7.0	7.0	55.0
	Neither agree nor disagree	11	11.0	11.0	66.0
	Agree	8	8.0	8.0	74.0
	Strongly agree	26	26.0	26.0	100.0
	Total	100	100.0	100.0	

Cotrimoxazole drugs are available all the time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	32	32.0	32.0	32.0
	Disagree	24	24.0	24.0	56.0
	Neither agree nor disagree	12	12.0	12.0	68.0
	Agree	20	20.0	20.0	88.0
	Strongly agree	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

Sometimes there no EID materials at the health facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	11	11.0	11.0	11.0
	Disagree	19	19.0	19.0	30.0
	Neither agree nor disagree	9	9.0	9.0	39.0
	Agree	4	4.0	4.0	43.0
	Strongly agree	57	57.0	57.0	100.0
	Total	100	100.0	100.0	

ARV prophylaxis drugs are available all the time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	44	44.0	44.0	44.0
	Disagree	7	7.0	7.0	51.0
	Neither agree nor disagree	29	29.0	29.0	80.0
	Agree	11	11.0	11.0	91.0
	Strongly agree	9	9.0	9.0	100.0
	Total	100	100.0	100.0	

Sample and results transportation system available

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	7	7.0	7.0	7.0
Disagree	24	24.0	24.0	31.0
Neither agree nor disagree	4	4.0	4.0	35.0
Agree	10	10.0	10.0	45.0
Strongly agree	55	55.0	55.0	100.0
Total	100	100.0	100.0	

Transportation system works as planned

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	42	42.0	42.0	42.0
Disagree	8	8.0	8.0	50.0
Neither agree nor disagree	30	30.0	30.0	80.0
Agree	11	11.0	11.0	91.0
Strongly agree	9	9.0	9.0	100.0
Total	100	100.0	100.0	

DBS sample and results transported on weekly basis

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	60	60.0	60.0	60.0
Disagree	4	4.0	4.0	64.0
Neither agree nor disagree	14	14.0	14.0	78.0
Agree	8	8.0	8.0	86.0
Strongly agree	14	14.0	14.0	100.0
Total	100	100.0	100.0	

The transportation system is reliable

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	43	43.0	43.0	43.0
Disagree	16	16.0	16.0	59.0
Neither agree nor disagree	7	7.0	7.0	66.0
Agree	4	4.0	4.0	70.0
Strongly agree	30	30.0	30.0	100.0
Total	100	100.0	100.0	

EID transportation guidelines available

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	2	2.0	2.0	2.0
Disagree	20	20.0	20.0	22.0
Neither agree nor disagree	11	11.0	11.0	33.0
Agree	10	10.0	10.0	43.0
Strongly agree	57	57.0	57.0	100.0
Total	100	100.0	100.0	

APPENDIX III: INFORMED CONSENT (ENGLISH VERSION) MZUMBE UNIVERSITY

Dear participant,

I am Wilfred Rwechungura, a student of Mzumbe pursuing master in Health monitoring and evaluation. I am conducting a study on early infant diagnosis for HIV infection and the associated health facility factors. The study is geared towards finding out more about utilisation of HIV testing among children born to HIV infected mothers and health facilities related factors that may facilitate or hinder them to receive HIV test and related follow up services. Thus, as you might guess, it has a lot of importance in contributing to the welfare of our children and their mothers.

You are asked for consent for your baby to join in this interview because she/he is born to HIV infected mother and the age of the baby is between 4 weeks and 18 months. If you accept to be interviewed on behalf of your child, you will be asked several questions regarding HIV and services which you and/or your child receive. This study will help us to learn about utilisation of HIV testing in children and provide basis for recommendations on the best ways of improving the services to the people by the responsible authorities.

You don't have to join the study. It is up to you. You may say YES or NO and no one will blame you or deny you from receiving your intended services. Before you say YES or No to be interviewed, I will answer any question you have and if you join interview you can ask questions at any time, just tell the interviewer you have a question.

APPENDIX IV: INFORMED CONSENT FORM (SWAHILI) CHUO KIKUU CHA MZUMBE

Ndugu mshiriki,

Mimi ninaitwa Wilfred Rwechungura, mwanafunzi wa Mzumbe ninasoma shahada ya uzamili katika ufuatiliaji na tathmini ya mifumo ya Afya. Napenda kukuelezea kuhusu utafiti ninaoufanya. Utafiti ninaofanya unaangalia utumiaji wa huduma za kuchunguza hali ya maambukizi ya virusi vya UKIMWI kwa watoto waliozaliwa na akina mama walio na maambukizi ya virusi vya UKIMWI. Pia napenda kujua hamaa na vikwazo katika kuwapatia huduma ya upimaji na huduma nyinginezo wanazostahili kupata watoto hao.

Kwa hiyo, unaombwa kutoa ridhaa ili mwanao aweze kushirikiswa katika utafiti huu kwani amezaliwa na mama mwenye maambukizi ya virusi vya UKIMWI na pia umri wake ni kati ya wiki 4 na miezi 18.

Ikiwa utaridhia kushiriki kwenye utafiti huu, kwa niaba ya mwanao utaulizwa maswali mbalimbali kuhusu UKIMWI na huduma zinazohusiana na virusi vya UKIMWI ulizopata wewe na mwanao. Utafiti huu utasaidia kujua utumiaji wa huduma ya upimaji wa hali ya maambukizi ya virusi vya UKIMWI kwa watoto na mapendekezo ya njia bora za utekelezaji wa huduma hii yatafikishwa kwa mamlaka husika. Uamuzi wa kujiunga na utafiti huu ni wako wala hushurutishwi kujiunga. Una ridhaa ya kukubali au kukataa kujiunga na utafiti huu wala hutalaumiwa au kunyimwa huduma nyingine kwa kutojiunga na utafiti. Kabla ya kutoa jibu la maombi haya ya kukutaka wewe ushiriki katika utafiti huu, iwapo una swali lolote waweza kuuliza. Pia, ukijiunga kwenye utafiti waweza kuuliza swali muda wowote.

**APPENDIX V: CONSENT AGREEMENT FORM (ENGLISH) MZUMBE
UNIVERSITY**

I, the parent or the legal guardian of have read the previous page of the consent form and the investigator has explained the details of the study. I, the parent or legal guardian, understand that I am free to ask additional questions.

I (the parent or legal guardian) understand that the research under way has no formal programme for compensating clients for any hurt arising from this research. Medical treatment will be provided at the usual charge to me or to my insurer unless payment is otherwise provided for in this consent form. I (the parent or legal guardian) understand that the participation to this interview is voluntary and no any penalty, loss of benefit or prejudice will be exercised to affect the quality of care I will receive upon my refusal to join the study interview.

PARENT OR LEGAL GUARDIAN DATE SIGNATURE/ FINGERPRINT
TEL/MOBILE NUMBER

.....

WILFRED W. RWECHUNGURA

INVESTIGATOR'S NAME DATE AND

SIGNATURE

INVESTIGATOR

TEL/MOBILE NUMBER +255786777743

APPENDIX V: CONSENT AGREEMENT FORM (SWAHILI) CHUO KIKUU
MZUMBE

Mimi mzazi/ mlezi halali wanimesoma
/nimesomewa maelezo ya ridhaa ya ushiriki kwenye utafiti ambayo pia mtafiti
amenielezea kuhusu utafiti husika. Mimi mzazi/mlezi naelewa kwamba niko huru
kuuliza maswali yoyote kuhusu utafiti huo.

Mimi mzazi/mlezi naelewa kwamba utafiti unaoendelea hauna mpango wowote
wa fidia kwa wateja watakaopata athari zozote katika utafiti. Matibabu
yatatikiana kwa kufuata mpango wa kawaida au kwa kutumia mfumo wa bima
na wala si gharama zitokanazo na utafiti. Mimi mzazi/mlezi naelewa kwamba
ushiriki wangu kwenye mahojiano ya utafiti huu ni wa hiari na hakuna adhabu au
kukosa huduma pindi nisipotoa ridhaa ya ushiriki au nikijitoa kwenye mahajiano
ya utafiti huu.

MZAZI/MLEZI

TAREHE SAHIHI AU

DOLEGUMBA

NAMBA YA SIMU

WILFRED W.RWECHUNGURA

.....

MTAFITI

TAREHE

SAHIHI YA MTAFTI

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