

Determinants of Utilization of Early Infant Human Immunodeficiency Virus Diagnostic Services at Kericho County Referral Hospital, Kericho County - Kenya

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ABSTRACT

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency syndrome (AIDS) has become a health challenge globally. It is a major cause of infant and childhood morbidity and mortality in Africa. This research was a cross sectional analytical survey to assess the determinants of utilization of Early Infant Diagnosis (EID) at Kericho County Referral Hospital (KCRH). Data was collected using pretested questionnaires, administered to the postnatal HIV positive mothers and or caretakers of HIV exposed children. Data was analyzed using SPSS software version 18.0. and presented using Chi-square and Logistic Regression analysis. Of the 254 respondents, 201 (79.1%) were biological mothers to the children, the rest were caretakers. The children were aged between 1 and 18 months with a mean age of 9.62 months. Majority of the respondents had adequate knowledge of adult HIV infection with regard to what HIV is, routes of transmission, diagnosis and treatment. Knowledge of pediatric HIV infection was however inadequate with only 132 (52%) respondents who knew the approximate rate of HIV transmission from mother to child and 130 (51.2%) who knew about the availability of pediatric Antiretroviral (ARV) drugs. Both adult and pediatric HIV knowledge was better with increasing level of education. The younger respondents were also more knowledgeable than the older ones. Children who had utilized EID were only 75 (29.5%). The significant determinants of EID utilization included: the level of education ($p=0.002$), the place of delivery ($p<0.01$), the age of the respondent ($p=0.008$), the distance to the nearest healthcare facility that offered EID ($p=0.004$) among others. The most significant determinants of EID utilization were the level of education, accessibility and the age of the respondents. In conclusion, EID utilization is still low in Kericho County. Improving maternal education is strongly recommended as it would improve EID uptake.

KEYWORDS: Utilization, EID, HIV, HIV Testing

I. INTRODUCTION

Over 90% of HIV infections among children are through Mother-to-Child Transmission (MTCT) (WHO, 2010a). The high rates of HIV infection among women, high birth rates, failure to utilize available Prevention of Mother to Child Transmission (PMTCT) interventions, and the widespread practice of prolonged breastfeeding translate into high rates of HIV transmission to children and hence a high burden of pediatric HIV disease. An estimated 1.8 million children globally were living with HIV in 2019 of whom 150,000 were newly infected in 2019 (UNAIDS, 2020) mainly through MTCT during pregnancy, child birth or breastfeeding. DNA PCR laboratory testing requires sophisticated and expensive equipment not available in most rural medical settings. The United States of America (USA) President's Emergency Fund for AIDS Relief (PEPFAR) supports some developing nations, such as Kenya, in expanding PCR testing (PEPFAR, 2008). However, for the child to undergo EID it needs the cooperation of other people; an infant must be brought by the mother/caretaker to a healthcare facility and healthcare providers must offer EID services to them. A 'cascade' of events must successfully occur for the full benefits of EID to be realized.

II. PROBLEM STATEMENT

HIV underlies pediatric deaths from common illnesses such as pneumonia and diarrheal diseases. Disease progression in HIV infected infants is fast, with a high mortality rate (> 50%) by 2 years of age (MOH PMTCT Guidelines, 2012). The fast rate of progression from HIV infection to developing AIDS, and the high morbidity and mortality among HIV infected young children, means that accurate HIV diagnosis for these children is urgent as this will make it possible for them to benefit from the available HIV interventions. In Kenya, the expected number of pregnancies per year is 1.7 million, with an average HIV prevalence of 6.9% among pregnant women (KNBS and ICF Macro, 2010). This means that up to a total of 52,785 children could potentially be infected with HIV every year without any intervention. This presents a huge risk of HIV exposure and transmission to children and is worsened by no or minimal PMTCT intervention among the larger proportion who deliver at home. HIV diagnosis among these exposed children is fundamental in order to intervene.

There were about 1411 pregnant women living with HIV in Kericho County in 2013. The county was ranked number 22 in the country with new HIV infections of 58 among children in 2013 (NACC, 2015). Despite availability of EID in Kericho, many HIV infected children under the age of 18 months remain undiagnosed or are diagnosed late. Late diagnosis results in poorer health outcomes and high mortality. Hence, there is need to understand the determinants of utilization of EID services in order to increase the uptake and thus benefit more children. WHO policy recommends immediate initiation of Antiretroviral Therapy (ART) for HIV positive children below two years of age (WHO, 2010d). Without better ways to identify infected children, the policy alone will not change the treatment landscape for children. Although EID can be technologically complex, expensive and not easily available, it is necessary to ensure that children and their families are not denied available care because of lack of making timely diagnosis. Efforts should therefore be made to utilize existing EID services and research on how to improve utilization and uptake is essential. The main objective of this study was to establish the determinants of Early Infant Diagnosis (EID) utilization among mothers/caregivers at Kericho County Referral Hospital.

III. LITERATURE REVIEW

The burden of HIV in children

Worldwide, children account for 5% of all people living with HIV and 9% of all new infections (UN Programme, 2016). HIV continues to weigh heavily on child health and survival. Children aged 0–4 years living with HIV are more likely to die than any people living with HIV of any other age (UNICEF, 2016) and most are dead before they are five years old (Newell *et al.*, 2004), and thus the magnitude of the problem has remained hidden for long. The high mortality in HIV infected children in Africa is mainly attributed to common childhood illnesses, malnutrition and lack of access to basic health care, HIV care and ARVs. Kenya is among the countries with a heavy burden of HIV among children. The cumulative number of children infected with HIV was estimated to be 11,500 in 2020 (UNICEF, 2020). An estimated 12,940 children in Kenya under age 15 became newly infected with HIV in 2013 alone (NACC, 2015). Even though it is widely known that early initiation of ARVs in children with HIV saves lives and that children respond to ARVs (Wamalwa *et al.*, 2007), HIV diagnosis and ART initiation often occur well after infancy (Ciaranello *et al.*, 2011). Provision of ARVs to children has specific challenges, including the faster progression to AIDS and death, the difficulty in diagnosing HIV in young children and the challenges in developing affordable and appropriate ARV regimens for children (UNAIDS/WHO, 2008).

Identifying all children infected with HIV as early as possible is an essential component to child survival. Inability to diagnose HIV in HIV exposed children shortly after birth leads to unnecessary treatment delays and has many health, social, and economic consequences (National Institutes of Health, 2005). In sub-Saharan Africa there are limited pediatric HIV diagnostic facilities and most HIV infected children are diagnosed very late in the course of illness, or are not diagnosed at all. While diagnosis of HIV in adults and older children can be done easily using rapid HIV test kits (which are mainly antibody tests), in young children antibody tests can only be used to identify HIV exposed children but not to make a HIV diagnosis. This is due to the persistence of maternal antibodies, until 18 months old, which are passed to the child as a natural means of protection while the infant is developing its own immune system. Diagnosing them therefore needs more demanding methods that rely on detecting the HIV virus itself (virologic tests) such as DNA and RNA PCR or P24 antigen test. Few facilities in Kenya are able to perform this test and in most cases as research or pilot studies (Cherutich *et al.*, 2008). The two main goals of EID are: to correctly inform the mothers/caretakers of the HIV exposed children the HIV status of the child and to link the HIV infected children to HIV care and treatment in good time so that they can benefit from the much-needed lifesaving medication. Despite the WHO recommendation to initiate ART in all HIV infected children below the age of 2 years (WHO, 2010d), the number of children in this age group being started on the ARV treatment has remained low. This is thought to be partly due to lack of access to early diagnosis of HIV and hence proper management of these children cannot be started. In order to improve access to EID, there is need to include EID in the Kenya PMTCT training curriculum so as to equip all the PMTCT healthcare providers with knowledge on EID (Hassan *et al.*, 2012). Where feasible, EID services should be decentralized beyond the district hospitals to the health centers and dispensaries. It remains to be seen whether this will increase the numbers tested and if the increase in testing will immediately lead to an increase in access to ART services for young children. Most of the documented studies on EID have been, based at healthcare facilities or national EID programs, and with provider or program perspective of the challenges faced in providing EID services. There are limited data on the determinants of EID utilization, which this study was designed to address.

Knowledge of EID and its availability, perceived importance of EID, financial constraints, distance to health facility, geographical relocation, religious beliefs, and attitude of health workers have been reported to be some factors that influence the utilization of EID services by mothers (Hampada *et al.*, 2017). Long turnaround time in receipt of results has also been found

to be a significant factor in utilization of EID (Ankrah and Dako-Gyeke, 2021). Despite the low coverage of EID services among HIV exposed infants, very few studies carried out in Kenya have looked at the factors leading to the low uptake of EID services. This study, therefore, sought to ascertain the factors that affect the uptake of EID of HIV services.

IV. METHODOLOGY

The study design was a cross sectional analytical survey which was conducted in post-natal and Child Welfare Clinic (CWC) and was on the mothers who had attended ANC at KCRH before delivery. In addition, there were home follow up visits, which were done with assistance from the PMTCT peer counsellors. The mothers had been tested for HIV at KCRH ANC clinic using an 'opt out' approach. The formula used by Fisher et al was used to calculate sample size in which the target was to include a minimum of 250 respondents, where children were alive. Purposive sampling was used by going through the register for the previous 3 years. The total number of confirmed HIV positive mothers in the ANC register were 716 for the 3 years. Systematic sampling was then used by selecting every second mother (hence 358). The target population was the HIV positive postnatal mothers and or caretakers (n=358) who had attended KCRH's ANC clinic. Out of the 358, twenty-eight were still in the antenatal phase, 4 children died before they attained the age of 6 weeks, 16 were not willing to participate and 56 could not be traced at all. This left a total of 254 respondents who were interviewed. Research instruments that were used in data collection were standardized structured pretested questionnaires.

Ethical considerations

Approval was obtained from the Kenya Medical Research Institute (KEMRI) Institutional Review Board (REF KEMRI/RES/7/3/1). Research permit was obtained from the Kericho District Commissioner (ADM 15/3 VOL VII/83). The County Department of Health Services and the Medical Superintendent of KCRH granted permission. Informed Consent was obtained from every participant. For those who did not understand English, the Kiswahili translated and approved consent forms were administered. Those who were not willing to participate were given their care without any negative implications. The data was kept confidential and no names were used for anonymity.

V. RESULTS

EpiData software Version 3.1 was used for data entry. Data was then analyzed using Statistical Package for Social Sciences (SPSS) version 18.0. Logistic Regression analysis was done using Stata 10 software.

Table 1: Characteristics of the respondents

Variable	Description	(N=254)	%=100%
Age of Respondent	≤ 35 years	216	85
	>35 Years	38	15
Residence	Rural	181	71.3
	Urban	73	28.7
Relationship to Child	Mother	201	79.1
	Caretaker	53	20.9
Level of Education	None	4	1.6
	Primary	118	46.4
	Secondary	101	39.8
	College	31	12.2
Occupation	Business person/Farmer	152	59.9
	Housewife	63	24.8
	Formal Employment	39	15.3
ANC Attendance	Once	25	9.8
	Twice	49	19.3
	Thrice	76	29.9
	More than thrice	104	40.9
ANC HIV Counselling Sessions	Once	164	64.6
	Twice or More	49	19.3
	Not Sure	41	16.1
Place of Delivery	Home	129	50.8
	Health Facility	125	49.2

A. Characteristics of the children

The mean age was 9.62 (9.62 ± 4.585) months. Nearly all the children 251 (98.8%) had been taken to the CWC, with a large proportion, 234 (92%) having been taken there by six weeks of age.

Table 2: Characteristics of the children

Variable	Description	(N=254)	%=100%
Birth Order	1 st Born	37	14.6
	2 nd -3 rd Born	133	52.4
	≥ 4 th	84	33
Previous admissions	Yes	74	29.1
	No	180	70.9
Rating of Child's Health	Perfect	171	67.3
	Fair	44	17.3
	Poor	39	15.4

The likelihood of EID being done was higher among those who were either first, second or third born children ($\chi^2 = 31.031$, $df=5$, $P<0.0001$, $n=254$). Children were less likely to be tested if their birth order was fourth born or beyond (i.e., 5th, 6th etc.). There was also a higher probability of the child being tested if they had been previously admitted for any reason ($\chi^2 = 4.300$, $df=4$, $P=0.038$, $n=254$).

B. Respondents' knowledge of pediatric HIV infection

Knowledge of pediatric HIV infection was rather inadequate with 198 (78%) of the respondents stating that MTCT was the only mode of HIV transmission to children. They did not know of other modes of HIV transmission to children such as sharing sharp objects with an infected person and blood transfusion with blood from an infected person. On enquiry about the rate of HIV transmission through MTCT, it was noted that only about half of the respondents, 132 (52.0%), knew the correct rate of transmission. Knowledge of the rate of transmission was associated with having obtained EID for the child ($\chi^2=16.698$, $df=3$, $p<0.01$) ($n=254$). When asked about the effect of HIV infection in children, 217 (85.4%) respondents knew that HIV infected children would have increased rates of morbidity and mortality, while 36 (14.2%) did not know. Those who knew that children with HIV would have increased rates of morbidity and mortality were more likely to have utilized EID for the child ($\chi^2=17.022$, $df=2$, $p<0.001$) ($n=254$).

With reference to the estimated length of time that the effects of HIV would begin to manifest in children, 202 (79.8%) respondents said correctly that the manifestation of signs and symptoms could be seen as early as at birth. Knowing that the effects of HIV could be noticed early in a child's life was associated with having utilized EID for the child ($\chi^2=23.453$, $df=2$, $p<0.001$) ($n=254$). Knowledge of availability of pediatric ARVs was associated with utilizing EID for the child ($\chi^2=45.831$, $df=2$, $p<0.0001$). Majority of the respondents, 211 (83.1%), were

aware about availability of pediatric HIV services at the nearest healthcare facility. Having knowledge on availability of pediatric HIV services was significantly associated with having utilized EID for the child ($\chi^2 = 48.322$, $df=1$, $p<0.001$) ($n=254$) as shown in Table 3.

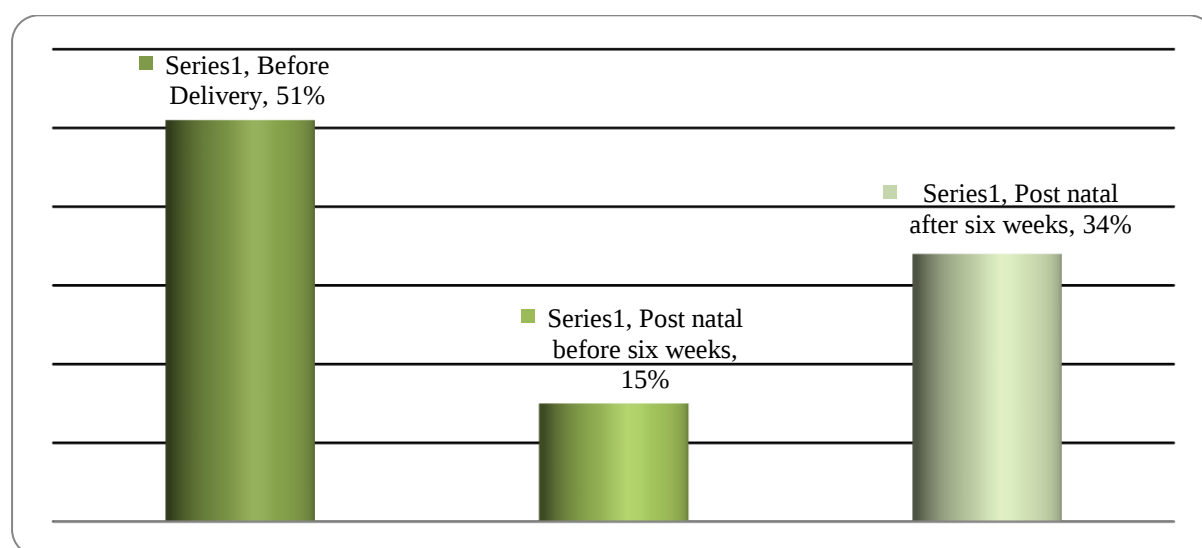
Table 3 Paediatric HIV knowledge and association with EID uptake

Variable	Description	Number (n)	Percentage (%)	Significance (p Value)
Rate of Transmission	Correct	132	52	<0.01
	Incorrect	122	48	
Pediatric HIV Diagnosis	Correct	185	72.8	<0.001
	Incorrect	89	27.2	
Effects of HIV on Child's Health	Correct	217	85.4	<0.001
	Incorrect	37	14.6	
Pediatric HIV Treatment (ARV)	Correct	130	51.2	<0.0001
	Incorrect	124	48.8	

C. Respondents' knowledge on existence of EID, its benefits and availability

The majority of the respondents, 233 (91.7%) reported to have known about EID before. This could be explained by the fact that all the mothers attended ANC clinic at KCRH where EID services were offered, and hence were more likely to have been told about EID. On enquiry about the timing of EID information, only about half, 119 (51.1%) of those who knew about EID, knew about it before delivery while the rest, 114 (48.9%), knew about it after delivery. Among those who knew about it after delivery, only 34 respondents knew about it when the infant was 6 weeks old or before. The remaining 80 respondents knew about it when the infant was more than six weeks old.

Fig 1: Timing of information on EID



There was fairly adequate knowledge on the benefits of EID with 236 (92.9%) respondents indicating that they knew the benefits of EID. With regard to knowledge of availability of EID services, a large proportion of the respondents 207 (81.5%) knew at least one healthcare facility that offered EID services. When subjected to chi-square statistics, it was observed that knowing at least one facility that offered EID services was significantly associated with the child having been tested on time through EID ($\chi^2 = 102.582$, $df=1$, $P < 0.001$).

Table 4: Respondents' knowledge on benefits and availability of EID

Had Knowledge	YES	NO
Benefits of EID	236 (93%)	18 (7%)
Health Facility that Offered EID	207 (81.5%)	47 (18.5%)

Accessibility in terms of the distance to the nearest healthcare facility that offered EID from the homes of the respondents was varied with 54 (26.1%) of them stating that it was at a walking distance, 36 (17.4%) said it was at a distance that required the use of a 'Boda boda' (motorcycle) while 117 (56.5%) reported that the facility was at a distance that required use of a vehicle. *D. EID Utilization at Six Weeks Old.* Only 75 (30%) of the respondents utilized EID for the children at or before they were six weeks old. Other children who had been tested for HIV after six weeks old were 104. Four caretakers were not sure whether the child had been tested or not, while the remaining 71 had never been tested at all. Among those who had never been tested, the reasons for not being tested were explored. The reasons given included lack of knowledge on the availability of the services, fear of knowing the HIV status of the child, the fact that they thought the child was still too young to be tested, healthcare facility related

problems (such as long queues, attitude of the staff and the location of EID room) among other reasons.

D. Receipt of the Test Results

In order for a HIV test to be of any benefit, the test results must be received so that it can subsequently be used to make decisions on how to care for the child. This completes the EID 'Cascade'. All the children who had been tested (children who obtained EID (75) and those who were tested for HIV after 6 weeks old (104) were considered. Only 138 (77.1%) reported to have received the test results; 65 (86.7%) among those who obtained EID at 6 weeks, and 73 (70.2%) among those who were tested after 6 weeks old.

E. Receipt of HIV test results

Timely receipt of test results is critical. Those who received the test results on time (within 4 weeks), were 113 (82%) while 25 (18%) received the results late. The main reasons for not receiving results cited included the fact that the test results were delayed, results were missing or misplaced and congestion in the clinic among others as shown in Figure 4.

F. Respondents knowledge of pediatric HIV

The knowledge on the rate of HIV transmission to children was subjected to Logistic Regression Model. Those who had inappropriate knowledge on the rate had a reduced log odd by 1.29 of having their children tested by six weeks of age compared to those who had adequate knowledge ($p < 0.01$).

G. Respondents' knowledge on existence of EID

Knowledge about EID among the respondents increased the probability of the children being tested as it was significantly associated with the child having undergone EID ($\chi^2 = 60.045$, $df = 1$, $p < 0.0001$) ($n = 254$). On the timing of information on EID, those who knew about EID before delivery had an increased Log odd by 1.29 of obtaining EID for their children at six weeks old compared to those who knew about EID after delivery. On the other hand, among those who knew about EID after delivery, those who had knowledge before the children were six weeks old had an increased log odd by 4.84 compared to those who knew about EID when their children were older than six weeks of age ($P < 0.01$).

H. Maternal ANC counselling session attendance

Those who attended more than twice had higher chances of obtaining EID for the child compared to those who attended only one counselling session. This was statistically significant with a p value of <0.01 and it increased the log odds by 1.9.

I. Relationship between HIV prophylaxis for PMTCT and EID uptake

As part of the assessment of the factors that affect utilization, respondents were asked whether the child received HIV prophylaxis after delivery. Only, 121 (47.6 %) of the children were reported to have received ARV drug (s) for HIV prophylaxis; those who received Single Dose Nevirapine (SD Nvp) alone were 75 (62.0%) while the remaining 46 (38.0%) received combined ARV drugs (a combination of Zidovudine and Nevirapine (and Lamivudine); thus double or triple therapy).

J. The ARV prophylaxis received

When subjected to the Logistic Regression Model, those who received ARV drugs for prophylaxis had a statistically significant probability of obtaining EID compared to those who did not receive any ($p<0.01$). Additionally, those who received combined ARV drugs had an increased log odd by 2.97 of obtaining EID compared to those who did not receive any prophylaxis.

K. Respondents' level of education

The log odds of EID being done decreased by 0.98 if one did not complete the primary level of education compared to those who had completed. On the other hand, having secondary level of education and above was highly significant in determining whether the child would obtain EID ($p<0.002$; the log odds of utilizing EID increased by 1.21).

M. The place of delivery

A comparison was made between those children who were born at healthcare facilities and those who were born at home. This was statistically significant in determining EID uptake with a higher chance among those who were born at healthcare facilities; the p value was < 0.01 , and the log odds of EID being done increased by 2.14 compared to those who delivered at home.

N. Age of the respondent

A contrast was made between the respondents who were 35 years old and below and those who were above 35 years old. This was statistically significant in predicting EID uptake with a p value of 0.008 with those who were younger being more likely to utilize EID. Those above 35 years old had a decreased log odd of obtaining EID, by 1.46 compared to those who were 35 years old and below. A comparison was made between the urban and rural dwellers. The urban dwellers were more likely to utilize EID. This was statistically significant in predicting EID uptake with a p value of < 0.01 . The log odds of EID being done for the urban dwellers increased by 1.28 compared to rural dwellers.

O. Accessibility

This was assessed in terms of distance to the nearest healthcare facility that offered EID. There was an increased chance of a child being tested if the distance to the health facility was a walking distance or a distance that required use of a 'Boda boda' (motorcycle). This increased the log odds by 1.14 with a P value of 0.004 compared to those who came from a distance that required the use of a vehicle. There was however no difference noted between those who came from a walking distance and those who came from a distance that required the use of a 'Boda Boda'.

P. Biological mother alive

A comparison was made between those children whose biological mothers were alive and those whose mothers had died. If the biological mother of the child was alive, there was an increased log odd by 2.28 of the children being tested by the age of six weeks as compared to if the mother was dead ($P=0.027$) (See table 5 in appendices).

VI. DISCUSSION

Only 75 (29.5%) children were tested by six weeks of age as recommended. A study in Malawi on infants born to HIV infected mothers who underwent EID showed that out of 646 HIV infected mothers, 338 (53%) brought their children for EID testing at six weeks of age (Dow *et al*, 2009). Another study in Côte d'Ivoire on all infants attending immunization and/or outpatient clinics showed that out of 7,579 children who were eligible for EID of HIV, 3,013 (40%) were offered EID testing, and only 447 (6% of total) accepted to be tested (Leroy *et al*, 2009). Additional efforts are therefore required in order to increase EID uptake at the recommended time of 4-6 weeks old.

Timely receipt of the test result is critical so as to ensure utilization of the results in making decisions on the care of the child. Among all the children who had been tested for HIV (either at 6 weeks or after) in this study, only 77.1% (138) respondents reported to have received the test results. This represents a gap, where tests are offered but the results are not utilized. The study in Kilifi revealed that out of 233 HIV exposed infants enrolled into care, 156 (67%) were tested and only 110 (71%) of those tested received the test results (Hassan *et al*, 2012). One of the main reasons given by the respondents in this study as to why they did not receive results was that the results delayed or that they were missing/misplaced. Structures therefore need to be put in place where there is clear communication between the laboratory and the clinics with specific contact persons to relay the results in a timely manner once they are out so as to improve on timely receipt and utilization of those results.

This study found that the most significant determinant associated with EID uptake was the level of education; the higher the level of education, the better the utilization of EID. According to KDHS 2008-09, a mother's education can exert a positive influence on children's health and survival (KDHS 2008-09). Improving education and creating awareness about the services would therefore lead to improved uptake. Kiragu *et al* (2008) argued that although the Kenyan Government provides free ART, clients bear additional costs which include transport, and that this is a major access barrier. This study illustrates that the distance to the nearest healthcare facility that offered EID was highly significant ($p=0.004$) in determining EID utilization. Where feasible EID services need to be decentralized to the lower-level healthcare facilities such as the health centers and dispensaries in order to improve EID access and hence uptake.

The respondents' opinion of the barriers to utilization of EID indicated that stigma and discrimination was one of the major barriers (235 respondents indicated that it was a barrier). Similarly, Kiragu and others reported that Stigma was cited by many respondents as a barrier to utilizing the available EID services and that many caregivers, especially mothers, expressed fear of being known to have a HIV positive child. It was also cited as one of the main reasons that HIV positive parents had delayed seeking HIV care for their children (Kiragu *et al*, 2008). Stigma and discrimination has been a major challenge in the provision of most of the HIV related services. There is a need to increase efforts to reduce stigma and discrimination as part of national HIV response as reported in the UNAIDS AIDS Epidemic report (2010).

Nevertheless, this study had some limitations because it only considered those children whose mothers attended ANC clinic at KDH. Non-attendees were not considered and hence this was a source of bias.

VII. CONCLUSIONS

The maternal and caregivers Knowledge of HIV influences utilization of EID services. Distance to health facility may affect the utilization of EID services. The study finding documented suboptimal utilization of EID service for HIV testing among the children.

Recommendations for further research

There is need for further research on:

- 1) How to effectively and efficiently start and complete the EID 'cascade' by up scaling uptake and improving receipt of the tests results by the healthcare workers and subsequently the mothers/caretakers in a timely manner so as to inform decision making.
- 2) Innovative local solutions and strategies to alleviate the impediments to EID utilization and to integrate all the health services for HIV exposed children 'under one roof' in order to ensure maintenance of the continuum of care should be sought.

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APPENDICES

APPENDIX I

Table 5: Logistic Regression of the Significant Factors that Affect EID Utilization

Variable	Category	No	%	P Value	Log Odds
Knowledge of Paediatric HIV	Rate of Transmission: 20-45%	132	52	P<0.01	1.29
	Above 50%	122	48		
Timing of Information on EID	Before Delivery	118	51.1	P<0.01	1.29
	Post-natal before six weeks	34	14.6	P<0.01	4.84
	Post-natal after six weeks	80	34.3		
ANC Counseling Attendance	Once	195	76.8	P<0.01	1.9
	Twice or More	59	23.2		
PMTCT	None	133	52.4	P<0.01	
	Single Dose Nevirapine	75	29.5		3.24
	Double/Triple Therapy	46	18.1		2.97
Level of Education	Primary Level and Below	122	48	P=0.002	1.21
	Secondary and Colleges	132	52		
Place of Delivery	Home	129	50.8	P<0.01	2.14
	Health Facility	125	49.2		
Age of Respondent	≤ 35 Years	216	85	P=0.008	1.46
	>35 Years	38	15		
Residence	Rural	179	70.5	P<0.01	1.28
	Urban	75	29.5		
Distance to the Health Facility	Walking	54	26.1	P=0.004	1.14
	Boda Boda	36	17.4		
	Vehicle	117	56.5		
Mother	Alive	232	91.3	P=0.027	2.28
	Dead	22	8.7		
Time of Maternal 1st HIV Diagnosis	≤ 2 Years	167	66	P=0.12	
	>2years	86	34		
Sibling Died	Yes	78	30.7	P=0.92	
	No	176	69.3		
Sibling Tested	Yes	66	29.6	P=0.94	
	No	157	70.4		