

**THE ACCEPTABILITY OF ROUTINELY OFFERED PEDIATRIC HIV
TESTING AT MBAGATHI HOSPITAL PEDIATRIC OUTPATIENT CLINICS**

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H58/75539/2014**

**A THESIS WRITTEN IN PART FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTERS OF MEDICINE IN PAEDIATRICS AND
CHILD HEALTH, UNIVERSITY OF NAIROBI**

2018

DECLARATIONS

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I declare that this thesis is my original work and does not to the best of my knowledge incorporate without acknowledgement, any material submitted for the award of a degree in any other university.

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DEDICATIONS

I dedicate this dissertation to my parents; my father, Rev. Oliver B. Soma and my mother, the late Mrs. Rose Luba Soma. Thank you mom and dad for investing your time, finances, prayers and emotions towards my education and success in my career aspirations. I am grateful for all the prayers and encouragement that you gave me especially during the tough times.

I am also thankful to my siblings Dr. Emmanuel and Mrs. Diana Roba, Eleazer and Esther, and my extended family; uncles and aunties, cousins, relatives and friends for always being understanding, encouraging and supportive during my studies. Last but not least, I am appreciative of my fiancé Dr. Moses Kajobinyi for being my number one cheerleader. God bless you all.

ACKNOWLEDGEMENTS

I am thankful to God for the far that he has brought me in this program. I would like to thank all the clients and staff at Mbagathi Hospital who were willing to be part of this study. I would especially like to thank the staff at Mbagathi Hospital CCC who went an extra mile in making this study successful; Nancy and Jane I appreciate all your efforts.

I would also like to acknowledge the input of Christine Kundu in transcribing the qualitative interviews and Helen Moraa in the coding and analysis of the qualitative data. My appreciation goes out to my statisticians Peter Mwangi, Vincent Were and Daniel Jaoko for their timely input and assistance in analyzing the quantitative data in this study. Special recognition goes to my supervisors Prof. Ruth Nduati and Dr. Lucy Mungai for all the input, guidance and support in making this thesis come alive. I am grateful to all my colleagues and faculty members who encouraged me throughout the whole process of concept development and data collection.

Last but not least, I am thankful to my sponsors, the DAAD for financial support during my studies and the thesis production support and to my employers, the University of Juba, South Sudan for granting me study leave to pursue my studies.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ARVs	Antiretroviral drugs
ART	Antiretroviral therapy
CCC	Comprehensive care clinic
CITC	Client initiated testing and counseling
CSW	Commercial sex worker
PCR	Polymerase chain reaction
DPT	Diphtheria, pertusis, tetanus vaccine
EID	Early Infant Diagnosis
FP	Family planning
HBTC	Home based testing and counseling
HEI	HIV exposed infants
HIV	Human immunodeficiency virus
HTC	HIV testing and counseling
HTS	HIV testing services
KIs	Key Informants
KII	Key Informant Interviews
KDHS	Kenya Demographic Health Survey
MCH	Mother and Child Health
MMED	Master of Medicine
MOH	Ministry of health
MTCT	Mother to child transmission
OVC	Orphans and vulnerable children
PMTCT	Prevention of Mother to Child Transmission
PITC	Provider initiated testing and counseling
RVD	Retroviral disease
TB	Tuberculosis
UNAIDS	United Nations program on HIV/AIDS

UNICEF United Nations International Children's Emergency fund
VCT Voluntary counseling and testing
WHO World Health Organization

DEFINITION OF TERMINOLOGY

Caregiver - a parent or guardian of the child presenting to the hospital and one who is responsible for the physical and emotional needs of the child, including their health care.

Previous HIV testing - testing done within the past one year.

ABSTRACT

Background: Routine screening for HIV is timely and cost-effective(1) but low uptake rates have been reported in general outpatient clinics(2). Routine HIV testing in the outpatient setting is not done well and missed opportunities have been noted (3).

Study Objectives: The primary objective of this study was to determine the acceptability of routinely offered HIV testing among children at Mbagathi Hospital pediatric outpatient clinics. Secondary objectives were to describe factors associated with testing and to explore perceptions and experiences on routine child HIV testing among caregivers and health workers respectively.

Methods: A cross-sectional survey method was adopted to determine the HIV testing acceptability rate and associated factors. Free listing, case studies and key informant interviews were the qualitative study methods used to explore caregiver and health worker perceptions and experiences.

Results: The acceptability of routinely offered pediatric HIV testing was 8.41% among 333 child/caregiver pairs. Lack of perceived risk of HIV infection and need for more time to think were cited as reasons for not accepting testing at 67.88% and 21.19% respectively. Caregivers disclosing their HIV status to their siblings and those with previous HIV testing were 7.6 times and 3.3 times more likely to accept child HIV testing than those disclosing to their spouses or not previously tested; (AOR=7.60; 95% CI: 1.23-46.78; p=0.029) and (AOR=3.33; 95% CI: 1.10 – 10.12; p=0.034) respectively. Children aged above 10 years were 9.85 times more likely to be tested than those less than 1 year (AOR= 9.85; 95% CI: 1.36 – 71.07, p=0.023). Poor health status of a child was a motivator for testing and health workers cited health resources constraints as reasons for poor implementation of routine testing.

Conclusions: There is low uptake of routinely offered pediatric HIV testing in the outpatient setting. Further studies are required to develop strategies to optimize uptake of HIV testing among children in this setting.

INTRODUCTION

The UNAIDS fact sheet of 2017, states that 36.7 million people globally were living with HIV by the end of 2016 and about half of this population was found in sub-Saharan Africa. Women and girls accounted for more than half [59%] of the total number of people living with HIV in eastern and southern Africa. Eastern and southern Africa accounts for 43% of the global total of new HIV infections. Of the 2.1 million children under the age of 15 who are living with HIV, less than half are on ART(4) mainly because many remain undiagnosed. Availability and access to HIV diagnostics for children are major bottlenecks to prompt ART initiation(5).

In 2015, about 150,000 children (aged 0–14 years) were newly infected with HIV globally, and 85 per cent of them were from sub-Saharan Africa(6). The Kenya AIDS Response Progress Report of 2016 shows that Kenya reduced the number of new HIV infections among children by 49% between 2013 and 2015. The HIV mother to child transmission rate reduced from 14% in 2013 to 8.3% in 2015 and 60% of new HIV infections among children in 2015 were from mothers diagnosed late in pregnancy or while attending post natal services(7). Globally, there is a shift in the timing of HIV transmission from mother to child as most infections are now occurring during the breast feeding period(6).

Mother to child transmission has been shown to account for over 90% of HIV infections in children under the age of 15yrs(8). The risk of breast milk transmission of HIV-1 is 16.2% and majority of infections occur early during breastfeeding(9). Without treatment by age 1 year, 35.2% infected and 4.9% uninfected children will have died; by 2 years of age, 52.5% and 7.6% will have died, respectively(10). Many children die before developing overt AIDS and early initiation of ART by 7 weeks of age results in significantly improved survival(11).

The use of breast milk substitutes prevents 44% of infant infections but compliance with this feeding method is much lower than with breastfeeding at 70% and 96% respectively(9). WHO and UNICEF recommend exclusive breastfeeding of children

whose mothers are living with HIV and who are maintained on ART for the first six months of life to optimize child survival. There is continued risk of HIV infection among key populations and new infections among children of mothers acquiring HIV infection in the postpartum period also occur (12).

The Early Infant Diagnosis (EID) program was developed for early identification of HIV exposed infants (HEI) but as per 2015, less than half of children born to mothers living with HIV in 2015 received an HIV test before reaching 2 months of age(6). In Kenya, only 35% of the exposed infants receive a PCR (Polymerase Chain Reaction) HIV test 6 weeks after birth. Many HIV exposed infants are falling through the cracks and cannot be accounted for by 18 months(13).

There is also a cohort of long term survivors of children with HIV infection who have survived well beyond infancy and are not on treatment. Many of these children lacked access to HIV testing as they were born before expansion of PMTCT and ART programs which unfortunately have not focused on improving strategies for identifying older children and adolescents growing up with HIV. Scaling up of HIV treatment and prevention in children will require a rapid increase in the volume of testing and counseling in order to identify all the above groups of HIV infected or exposed children(14).

HIV testing services in children will need to extend beyond the antenatal and perinatal period to capture the early post natal period and pediatric outpatient clinics as avenues for early intervention. Routine pediatric HIV testing at any point of contact with health workers is one of the strategies through which infants whose mothers did not receive PMTCT and those acquiring HIV infection postnatally can be identified and linked to care. This study seeks to evaluate PITC in pediatric outpatient settings.

LITERATURE REVIEW

Children have been shown to have a more rapid progression of HIV infection as compared to adults(15). A pooled analysis of studies from sub-Saharan Africa showed that the net survival at 1 year post infection for those infected up to six weeks after birth is 52% and 78% for late postnatal transmission(16).

Early anti-retroviral treatment reduces the mortality and progression of HIV by 76% and 75% respectively(11). A study by Wamalwa et al in Kenya showed that early ART reduced the risk of hospitalizations from 58% to 17%(17). However, universal access to ART to all children in need had not been achieved by 2015 as coverage reached only 49% in 2015(18) and this is because very few children are being identified early and in a systematic manner.

Pediatric HIV Testing Guidelines

Current WHO 2010 guidelines on early infant HIV diagnosis recommend routine HIV testing as opposed to a targeted approach in children. The 2010 WHO guidelines on early infant HIV diagnosis stipulates that all infants with unknown or uncertain HIV exposure being seen in health-care facilities at or around birth or at the first postnatal visit (4–6 weeks), or other child health visit, must have their HIV exposure status ascertained(19). In Kenya, the most recent guidelines which were launched in 2015 also recommend that the HIV exposure status of all infants should be established at 6 weeks or at first contact, whichever is earlier(20).

The HIV testing algorithm starts by ascertaining whether a mother was previously tested for HIV or not and whether their HIV status is known. Mothers who have had no previous testing are eligible for HIV antibody test and should be offered testing. All children of mothers testing positive for HIV and are less than 18months should be started on infant ARV prophylaxis and offered routine HIV DNA PCR testing at first contact or within 6 weeks(20).

Infants with an initial positive HIV DNA PCR result should be presumed to be HIV infected and started on ART in line with national guidelines, with a confirmatory HIV DNA PCR and baseline viral load taken at the time of ART initiation (ART initiation is based on the first result). Infants with initial negative results should continue infant ARV prophylaxis and followed-up as HEIs. New guidelines recommend repeat testing at 6 months and 12 months if the 6 week HIV/DNA PCR is negative. An antibody test should be performed for all HEI at 18 months, and also 6 weeks after complete cessation of breastfeeding(20).

Repeat testing should be offered to mothers to detect incident infections in those who previously tested negative and to diagnose women in the postpartum period who did not receive antenatal care. Testing can be offered to the children if the mother declines testing or is not available. This will identify infants who acquire HIV through late postnatal transmission which accounts for about 42% of new infant infections(21).

Detection and prevention of incident HIV in pregnancy/postpartum should be prioritized, and is critical to decrease MTCT(12). In Zambia, testing of all breastfeeding and recently breastfeeding mothers who have had an unknown or previously negative HIV status is recommended every 3 months until the infant reaches 18 months of age(22). In Kenya, the new guidelines recommend repeat testing as long as an infant is potentially exposed. If the child is known to be HIV negative from previous testing and has no new risk factors/exposures then repeat testing is not required until adolescence(20).

HIV Testing Approaches in Kenya

The two approaches for HIV Testing Services (HTS) in Kenya are Client Initiated Testing and Counseling (CITC) and Provider Initiated Testing and Counseling (PITC). Client initiated testing and counseling (CITC) entails the client seeking and initiating the HTC service either in the community or health facility settings based on their own volition. Provider initiated testing and counseling (PITC) entails when a service provider offers HIV testing to clients within a facility, regardless of the reason for the visit(20).

Provider initiated testing and counseling (PITC) places the onus of initiating HTC on the health provider and it is offered with an “opt-out” option based on informed choice. Routine opt out PITC should be offered to all patients at all health facilities regardless of disease symptoms or the purpose of the visit. Priority service delivery points include(20):

- Inpatient facilities
- Outpatient facilities or departments
- Maternal and child health clinics

Settings for HIV Testing in Children

PMTCT programs, the major entry point for HIV testing in children, have encountered service and patient-related challenges which compromise their effectiveness leading to later identification of children with previously undiagnosed HIV. The challenges in PMTCT include suboptimal PMTCT program coverage, late presentation for the first antenatal visit, maternal seroconversion after the first visit with insufficient repeat testing in late pregnancy, suboptimal postpartum follow-up and continued exposure for breastfed infants.

Coverage of key interventions in PMTCT services has been sub-optimal. A July 2015 report compiling data from UNAIDS/UNICEF/WHO Global AIDS Response Progress Reporting and UNAIDS 2014 HIV and AIDS estimates shows that in a population of 100 pregnant women ,only 78% attend antenatal care(ANC), less than half get tested for HIV and only 22.5% of children receive early infant HIV testing and diagnosis(23).

A study among HIV-exposed infants also showed that hospital-based testing was more likely to detect an HIV-infected infant than PMTCT testing(24). The above findings show that the pediatric HIV testing strategy needs to expand beyond the antenatal period to capture HIV exposed or infected children who may not have been picked in the PMTCT programs. Young symptomatic infants diagnosed with HIV during hospitalization have very high mortality and every effort should be made to diagnose HIV infections before symptom onset(24).

Limited testing opportunities after the postnatal period is a major barrier to increasing access to HIV treatment in children(25). Beyond the ANC/PMTCT model, the other settings where children can be captured for HIV testing are the immunization clinics, under five pediatric outpatient clinics, pediatric inpatient wards and malnutrition centers. In Kenya, the following considerations are recommended to ensure infants and children of unknown HIV exposure status are tested for HIV(20):

- Test all children and adolescents attending TB clinics, malnutrition services, and/or admitted to the pediatric ward
- Test all orphans and vulnerable children (OVC)
- In high prevalence settings (>5%), ascertain HIV exposure status of all infants attending immunization or under-5 clinics to identify HIV-exposed infants
- Test all sick children with unknown HIV status presenting at health facilities
- Test all children whose mothers died of unknown conditions
- Test all children with a history of exposure to exceptional circumstances including, sexual abuse and wet nurse babies

HIV Testing In Pediatric Outpatient Clinics

Outpatient clinics in children include the Mother and Child Health (MCH) clinic for well babies, general pediatric outpatient clinic where sick children are reviewed and specialist clinics where children are followed up for known medical conditions. Mother and Child Health Clinics are vital in child survival programs because this where preventive services such as antenatal, prenatal and postnatal care, immunization, weight and growth monitoring services are offered. Integration of HIV testing and diagnosis into child survival platforms has been described as one of the key strategies towards attaining the UNAIDS targets of ‘90-90-90’ in children ; 90% of people living with HIV will be diagnosed, 90% on ART and 90% viral suppression for those on ART(26).

Acceptability studies on routine pediatric HIV testing have shown more success in the inpatient setting as opposed to the outpatient setting. The acceptability rate towards routinely offered pediatric HIV testing in a study conducted in KNH inpatient pediatric

wards was 95.1% and 13.8% had a positive HIV test with 7.8% confirmed as HIV infected and 6.0% being HIV exposed(27). The same findings were seen in a study conducted in inpatient wards at Lubango Provincial Pediatric Hospital in Angola where the acceptability rate towards HIV testing was 92%(28).

Findings from immunization clinics have also had favorable acceptability rates of 94.2% in Tanzania(29), 94.2% and 90.4% in Cape town(30) and Kwazulu-Natal, both in South Africa(31) respectively. The benefits of routine pediatric HIV testing during immunization at MCH clinics have been that it is time saving and an opportunity to learn about the child's HIV status for early ART, prophylaxis and linkage to care(29).

In contrast to the findings in the inpatient setting and immunization clinics, findings in a Durban outpatient clinic in South Africa were not as favorable since the acceptability rate was 52% with a 95% confidence interval of 49-54%. During the study period lasting thirteen months, there was an increase in the average number of HIV tests during the routine testing period compared with the baseline HIV testing periods. The study in Durban showed that despite the moderate acceptability rates towards testing, the HIV prevalence was extraordinarily high with 6% newly diagnosed HIV-infected children. The study concluded that routine HIV testing identifies a high burden of HIV and is a feasible and moderately acceptable strategy in an outpatient clinic in a high prevalence area (2).

Other studies have shown similar poor acceptability rates like 40.7% in Durban, South Africa among children aged 12-17 years(32), 54.2% in Zimbabwe among children aged 6-15 years(33), 32.5% (34) and 57% (35) among children aged 0 to 15 years in Kenya and 9.8% in South eastern Uganda(36). All the five studies above were done in the outpatient context and one was done in an urban secondary hospital while the rest were done in a primary health care setting. Three of the studies used family centered HTC strategy while the rest used the PITC strategy. The acceptability rates in studies utilizing the PITC strategy were higher than those using the family centered HTC strategy with the lowest acceptability rate seen in the study in south eastern Uganda at 9.8%(36).

Only one of the five studies utilized both quantitative and qualitative methods to determine acceptability to testing. However, this study which was done in Zimbabwe, failed to capture the perspectives of caregivers because only health workers were included in semi structured interviews. The table 1.gives a summary on studies done on HIV testing among children in the outpatient setting and the acceptability rates of testing in those studies.

Table 1:Summary of acceptability studies on HIV testing offered to children in the outpatient setting

Author	Year	Country	Setting	Context	HTC strategy	Age (yrs)	Acceptability rates
Ramirez-Avila et al. (2012)	2008 to 2009	South Africa, Durban (Kwa Zulu-Natal)	Secondary hospital, urban	Outpatient	PITC	12 to 17 yrs	40.7%
Kranzer et al. (2014)	2013	Zimbabwe Harare	PHC	Outpatient	PITC	6 to 15 yrs	71.3%
Mongare et al. (2013)	2009 to 2012	Kenya	Primary healthcare facilities	Outpatient	Family centered HTC	0 to 15 yrs	32.5%
Kulzer et al. (2012)	2007 to 2009	Kenya	Primary healthcare facilities	Outpatient	Family centered HTC	0 to 15 yrs	57.0%
Lugada et al. (2010)	2005 to 2007	Uganda, South Eastern	PHC	Outpatient	Family centered HTC	6 to 14 yrs	9.8%

Missed Opportunities for HIV Testing In Pediatric Outpatient Clinics

Primary care pediatric outpatient clinics are one of the clinical settings where the largest missed opportunities for HIV testing in children are found. A survey on missed opportunities for HIV testing among one hundred and sixty one children accessing health services at Mbagathi Hospital in Nairobi, Kenya revealed an overall missed opportunity of 43.2% for HIV testing. The largest missed opportunities occurred in the outpatient department at 54% followed by the MCH clinic at 31.3% as opposed to the inpatient wards

where testing coverage was high(3). These findings demonstrate that despite MOH recommendation to offer routine pediatric HIV testing to all children visiting a health facility (irregardless of the purpose of the visit); routine pediatric HIV testing is not universal at Mbagathi Hospital pediatric outpatient clinics.

In Zimbabwe, a study offering PITC to children in primary care clinics found that overall, 116 (88%) of HIV infected children identified had a missed opportunity for earlier diagnosis: 88 (67%) of these children had attended a primary care clinic in the past six months(37). In another study in Zimbabwe, more than 90% of children who tested HIV-positive had had previous contact with health services, had biological parents currently in HIV care, or had a verbal report of a positive HIV result(33).

In Kenya, preliminary findings of the Pediatric Urgent Start of HAART (PUSH) study showed that 43% of inpatient children newly diagnosed to have HIV had been seen in the outpatient department one month prior to admission(38). The studies show that there exists a large missed opportunity for HIV testing in the outpatient setting among newly diagnosed HIV infected children identified in inpatient wards where HIV testing is universal. This group of children would have benefited from early testing, care and treatment thus averting the poor outcomes associated with hospitalizations, had they been identified and started on treatment well before they were sick enough to be admitted.

Perspectives of Caregivers and Health Workers on routinely offered pediatric HIV Testing

Information about context, attitudes, and behaviors relating to HIV testing is necessary to improve our understanding of the factors that facilitate or hinder testing. HIV testing in children is influenced by both caregiver and health worker attitudes. Exploring the different perspectives of health workers and caregivers in depth is important because unexplored differences in the perspectives of these two groups can lead to conflicting expectations and health service delivery that does not meet the needs of the target population.

Success in scaling up of HIV prevention and treatment can only be realized once fears of testing are overcome, adverse consequences of disclosure are avoided, and appropriate referrals are made(14). Some motivators for pediatric HIV testing include sickness in the child or the death of a sibling(39).

Studies among adults in both developed and developing countries show that the major barrier to the utilization of HIV testing is an individual's reluctance to acknowledge that they are at risk even when in fact they are.(14). Literature has shown that individuals' perceptions of their risk of HIV often do not match objective assessments. Correct and erroneous notions of HIV transmission and treatment coexist. Such notions include doubting the existence of HIV, denying dangers, inexplicable optimism and failure to adopt protective behaviors(40). Traditional health beliefs, religious beliefs and alternate beliefs on HIV among caregivers have been hindrances towards uptake of pediatric HIV testing(41).

Fear has been reported as one of the main reasons why people do not take HIV tests or return for results. Fear is not only about the health consequences of HIV but the social consequences such as rejection by loved ones, discrimination, and violence(14).

In some countries, pediatric testing has been avoided for fear that HIV-infected children might be abandoned or neglected by families or caregivers(42).In Tanzania, caregivers in rural areas expressed fear of HIV, stigma and concerns over privacy and confidentiality(29) while in South Africa, mothers expressed fears about lack of confidentiality from nurses, and that receiving HIV-related services could lead to unintentional disclosure of their HIV status(43).

The role of stigma in impeding the utilization of testing is a recurrent theme in the literature. Stigma against HIV is pervasive and consistently reported as a deterrent of testing(44). In a missed opportunities survey at Mbagathi Hospital, 65.8% of their caregivers declined testing citing fear of stigma and the perception that the child was too young for

testing(3). Normalization of HIV testing is one of the ways that stigma associated with testing can be reduced but more evidence is required on factors that are amenable to change and would encourage testing(14).

Even in health care settings, health workers may stigmatize patients by treating them differently, using excessive precautions, or withholding appropriate care. Much is expected of health workers who may feel helpless, pessimistic, and doubtful of their ability to provide care(44). In Tanzania, health workers were concerned that providing HIV testing during immunization would interfere with patient flow and increase workload(29) and these are reasons that may make health workers reluctant to offer routine HIV testing in these settings. Exploring the perspectives of health workers is vital in understanding the attitudes and beliefs shaping their practices and to identify their training needs and resources necessary to deliver HIV testing services(14).

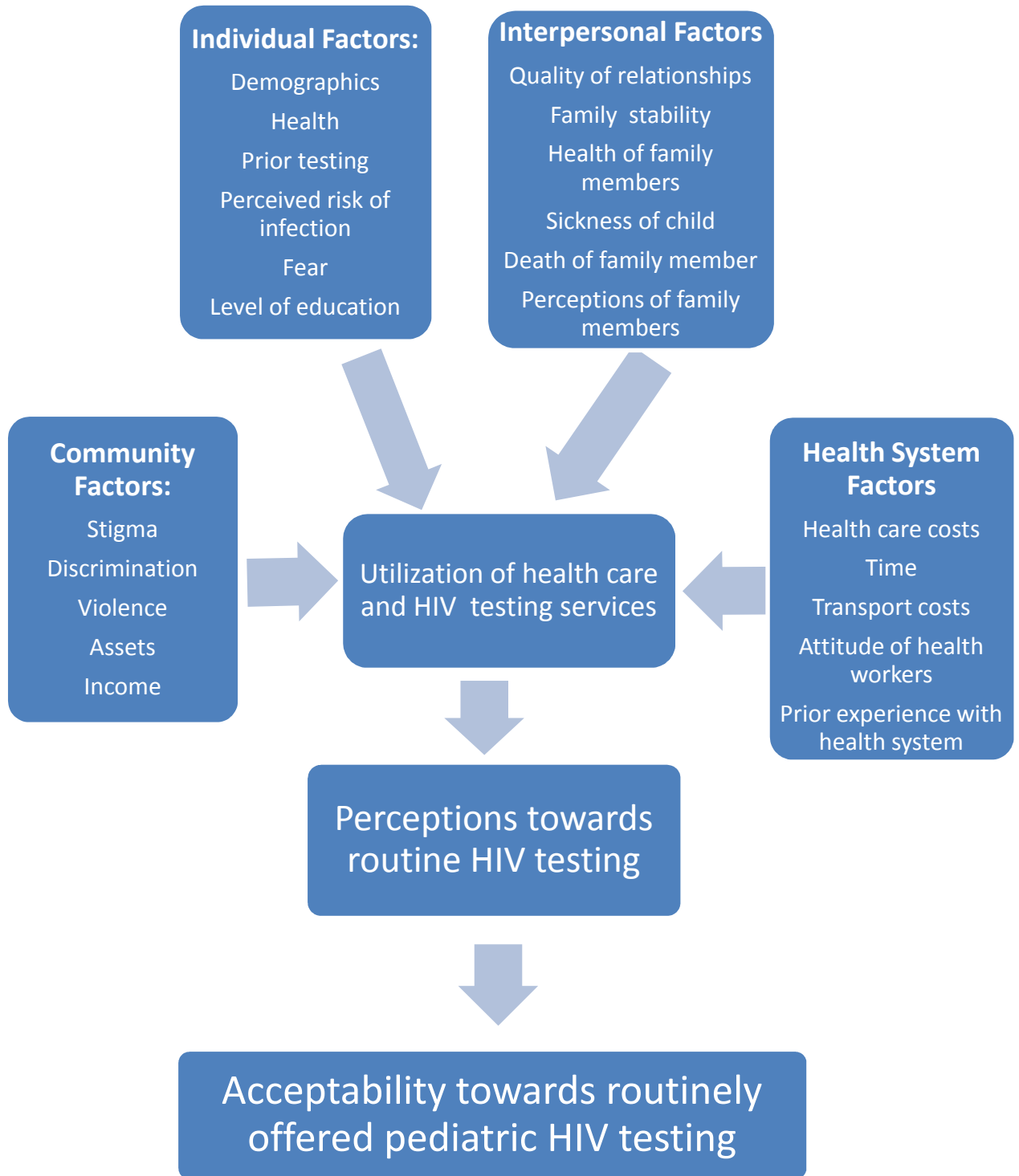
Effective implementation of routine pediatric HIV testing depends on the ability and willingness of health workers to take every opportunity to identify HIV-infected children. In South Africa, nurses were frequently unwilling to check for HIV in all children, believing it was unnecessary and unacceptable to mothers. Nurses feared mothers would become upset or make a complaint. On the other hand, mothers supported implementation of routine checks but noted that the attitude of the nurse was important in determining the acceptability of HIV related questions(43).

Many HCWs in Zimbabwe expressed skepticism around the PITC initiative in children and some did not offer testing for fear that children would be perceived as burdens in the household if they tested positive, leading to maltreatment, stigmatization, or even abandonment. There was also confusion noted on testing guidelines and regulations and many complained of stock-outs of testing kits, long client waiting times, increases in workload and insufficient space to provide comprehensive counseling(33).

Among children, obtaining informed consent raises special, additional concerns, as children are generally not considered capable of informed consent. Research with children requires adults to provide consent and prompts consideration of additional measures, such as obtaining children's assent. Fear of HIV status disclosure to children could hinder the uptake of testing especially among parents who feel that children should not be involved in this process. This may also pose a problem for health workers when there is a conflict between caregivers and children. Perceptions of caregivers with regards to assent for children will be explored.

The conceptual framework in figure1.was based on the Anderson's model of health services utilization(45) and was used to guide the process of exploring the perceptions of caregivers and health workers towards routinely offered HIV testing among children.

Figure 1: Conceptual framework on acceptability of routinely offered HIV testing in children



STUDY JUSTIFICATION AND UTILITY

Few studies have been done on acceptability rates to HIV testing for children accessing outpatient medical services as opposed to the many studies available on children accessing inpatient services. This is despite the fact that most HIV infected children identified in wards have missed opportunities for testing during their prior encounters with health workers in the outpatient setting. Findings from studies available show poor acceptability rates for HIV testing among children in the outpatient setting. Local studies on the acceptability of routinely offered PITC in pediatric outpatient clinics are limited.

The true acceptability of HIV testing among children attending Mbagathi Hospital pediatric outpatient clinics is unknown. A missed opportunities survey in this facility also revealed large missed opportunities of 54% at the outpatient department and 31.3% at the MCH clinic. The study did not include children seen in other follow-up clinics like the nutrition clinic, TB clinic, pediatric outpatient clinic (POPC) and pediatric surgical outpatient clinic (PSOPC). Twenty five (34.2%) of those found with missed opportunities gave consent for testing(3) but the study did not determine if testing was actually done.

This study offered HIV testing to children attending Mbagathi Hospital pediatric outpatient clinics and sought to provide information on the acceptability of routinely offered pediatric HIV testing at these clinics. Qualitative research methods were used to give insight into the perceptions of caregivers and health workers thus unveiling underlying concerns, challenges and opportunities so that service delivery may be responsive, effective and adapted to meet the needs of the child and the family.

STUDY GOAL

The overall goal of this study was to provide knowledge that will increase pediatric HIV testing among children.

STUDY OBJECTIVES

Primary Objective

To determine the acceptability of routinely offered HIV testing among children at Mbagathi Hospital pediatric outpatient clinics.

Secondary Objectives

- To describe the socio-demographic and individual characteristics of children and caregivers associated with acceptability or non-acceptability of routinely offered child HIV testing at Mbagathi Hospital pediatric outpatient clinics.
- To describe the experiences and perceptions of caregivers towards routinely offered child HIV testing at Mbagathi Hospital pediatric outpatient clinics.
- To describe the experiences and perceptions of health workers towards routinely offered child HIV testing at Mbagathi Hospital pediatric outpatient clinics.

METHODS

Study Design

This was a mixed methods study utilizing qualitative and quantitative research methods. A cross-sectional survey method was adopted to achieve the objectives of aim one and two. A qualitative study method was utilized to achieve the objectives of aim three and four and included free listing, case studies and key informant interviews (KIIs).

Study Setting

Mbagathi Hospital is a level two teaching hospital in Nairobi County where the HIV infection rate among women is 8.4% (46). Pediatric outpatient clinics in Mbagathi Hospital include the mother and child health clinic (MCH), nutrition clinic, TB clinic, pediatric outpatient clinic (POPC), pediatric surgical outpatient clinic (PSOPC) and the pediatric OPD (casualty).

The distribution of the client load at the various clinics, clinic days, volume of patients and testing approach per clinic is shown in table 2.

Study Duration

Data collection was carried out between June 2017 and August 2017 for the quantitative data and between August 2017 and October 2017 for the qualitative data.

Study Population

All child-caregiver pairs attending Mbagathi Hospital pediatric outpatient clinics and all health workers at Mbagathi Hospital pediatric outpatient clinics.

Health workers recruited in the study included all cadres of nurses, doctors, PITC counselors and clinical officers working at the clinics.

Table 2: Client load at various pediatric outpatient clinics

Clinic	Target Population	Clinic Days	Volume of Patients	Testing approach
OPD	Sick children	24 hours Daily	80 per day	Targeted/clinician discretion PITC opt in PITC opt out(rarely done)
MCH	Well children Immunization Growth monitoring Routine postnatal	8am to 5pm Monday to Friday	20 per day	EID for HEI PITC for ANC or postnatal women PITC opt in for children of HIV negative mothers
Nutrition	Malnourished children	8am to 5pm Monday to Friday	10-20 per day	Targeted/clinician discretion
POPC	Surgical patients follow up	8am to 12pm Wednesday	10-20/clinic day	Targeted/clinician discretion
POPC	Chronic illness follow up	8am to 12am Mondays and Fridays	10-20/clinic day	Targeted/clinician discretion
TB	TB infected clients	8am to 5pm Monday to Friday	0-12 TB clients per month	PITC done routinely only for TB clients

Inclusion Criteria

Children aged 0-15 years

Children of unknown or undocumented HIV status

Consent given by caregiver

Assent by children age 10-15 years

Children attending Mbagathi Hospital pediatric outpatient clinics

Health workers at Mbagathi Hospital pediatric outpatient clinics or involved in management of the pediatric outpatient clinics.

Caregivers of children previously tested in pediatric outpatient clinics were included in the qualitative arm of the study.

Exclusion Criteria

Children whose caregivers do not give consent

Children more than 15 years of age

Children aged 10-15 years who refuse to give assent to participate in the study

Known HIV positive children

Children whose mothers had documented HIV testing at 6 weeks and re-testing at 6, 12 months of age or children with documented testing within the last 3 months.

Children attending clinic without a guardian or caregiver (unless an emancipated minor)

Critically ill children requiring emergency care, immediate hospitalization or are moribund.

Sampling Methods

Consecutive sampling: every consecutive patient seen at the pediatric outpatient clinics and meeting the inclusion criteria was recruited.

A sample size of 333 was calculated using the Fischer's formula and adjusted to a finite population, the number seen in three months as follows:

$$\frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$
$$\frac{500 \times 1.96 \times 1.96 \times 0.5(1-0.5)}{0.05 \times 0.05(5000-1) + 1.96 \times 1.96(1-0.5)}$$
$$= 333$$

- N = estimated number of caregiver/child pairs seen at the MCH/OPD for the study period. Estimated at 5000 based on review of MCH/OPD registers.

- $P =$ estimated at 50%.
- $1-P = 1$ minus prevalence (1-0.5)
- $Z = 95\%$ level of confidence (1.96)
- $d =$ desired level of precision set to 0.05 (5%)

The number of caregiver/child pairs recruited per clinic was at the ratio of 1: 1.6: 3.3: 6.5 for the nutrition clinic; POPC & PSOPC clinics; MCH and OPD clinics respectively. This ratio was comparable to a previously calculated ratio of 1:2:3:7 that was calculated as per review of registers of the number of clients seen in each clinic per day.

Study participants for the qualitative arm of the study were ‘purposively’ selected. Purposive selection is a qualitative research sampling strategy where participants are not randomly selected but are selected on the depth or quality of information that they give. This part of the study included 2 caregivers for case studies, 12 health workers for key informant interviews (KIIs) and 20 caregivers for free listing interviews. The total sample size for the qualitative study was 34.

Recruitment Procedures

Ethical clearance was obtained from the KNH/UON ERC board and the approval letter is attached in appendix 1. Data collection was done on all days of the week from 7am to 7pm. Child/caregiver pairs were screened for eligibility, approached for consent and recruited into the study by the research team. Caregiver consent forms for the survey are attached in appendices 4 to 7.

After obtaining consent, caregivers were interviewed in a private room. The interviews were done using a standard structured questionnaire that contained information on the demographics of the caregiver and individual characteristics of the caregiver and child pairs. The standard structured questionnaire is attached in Appendix 8.

Provider Initiated Testing

Provider initiated testing was offered using a rapid HIV test as part of routine patient care with an opt out option clearly explained. Caregivers were assured that declining to test would not affect their care or service delivery. Caregivers who consented to testing were offered testing for them and their children and the results were disclosed to them. Pre and post test counseling was done by a trained PITC counselor who offered the test. Caregivers who did not consent to testing were not tested. HIV counseling information is attached in appendix 2.

Data Collection

Clinical Procedures

Pre-test Information

The objectives of the pre-test session focused on giving information on the benefits of routine testing for HIV in children. Caregivers were told that routine testing is part of government policy for all children seen at health facilities and that this service is offered regardless of the purpose of the visit. This was done to reassure them that they or their children were not being singled out for testing and that it was just a normal procedure. The HIV testing process was explained individually and informed consent was sought before testing. The importance of disclosure to the health providers was emphasized and information on available post-test services was given.

HIV testing test kits

HIV testing was carried out in series using Determine HIV1/2 test kit and positive tests were confirmed by the First Response test kits as per national guidelines. A test result was considered positive when a line appeared at both the test and the control site while a negative test result occurred when a line appeared only at the control site. A test result was considered invalid when both lines at the control or the test site were not there or the line appeared at the test site and no line appeared at the control site. In case of an invalid result, the HIV test was repeated at the same session. The appendix 3. describes the HIV test kits used and demonstrates interpretation of the test results.

A final positive test result was considered when both the screening and confirmatory test results were found positive and a test result was considered negative when only the screening test result was found negative. A test result was considered discordant when the screening test result was found positive while the confirmatory test result was found negative.

Sample collection for HIV testing

Counseling and testing was done by a qualified PITC counselor. Both the caregiver and the child were offered testing. The fingertip of the left ring finger was cleaned 3 times using 3 different spirit swabs and allowed to air dry. A sterile lancet was used to puncture off centre on the fingertip and the first drop of blood was wiped away using a sterile gauze pad. The used lancet was disposed in a bio-hazard sharps container and the finger was held below elbow level and pressure applied to the pulp of the punctured finger to obtain blood. A micropipette was used to draw 70microlitre of blood which was applied to the sample pads of the test kits and read after 15 minutes. The results were disclosed and explained to the caregiver.

Post-test Counseling

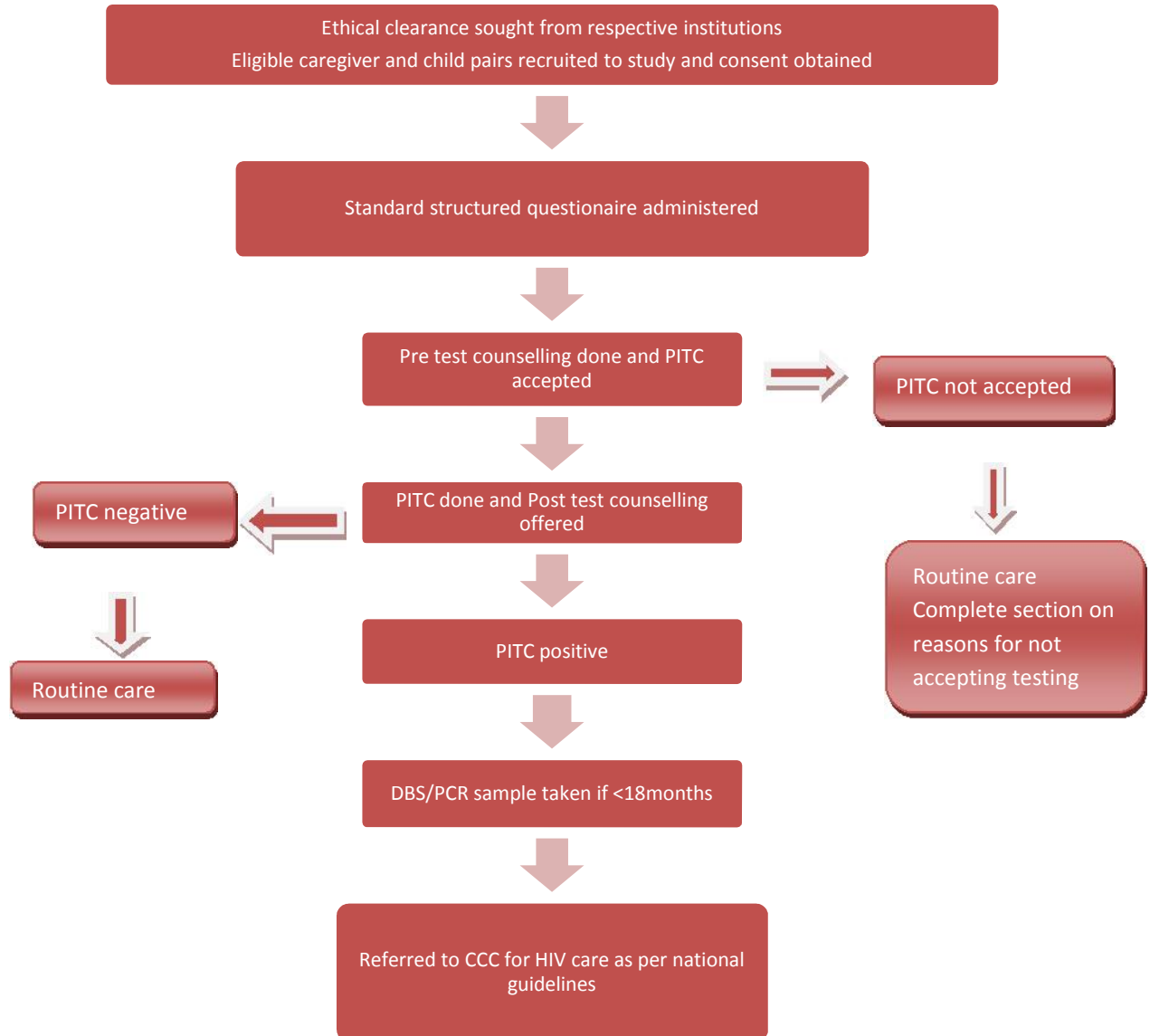
Post-test counseling was offered for all who tested either HIV positive or negative and the aim was to communicate the HIV test results and to assess understanding of the test results. For those testing HIV positive, referral to care and treatment, benefits of treatment and adherence and development of risk reduction plan were discussed. Aspects of HIV care that were emphasized included HAART, cotrimoxazole prophylaxis, immunization, breastfeeding counseling and family testing of their partners and other children.

Linkage to further care

All caregiver/child pairs with positive results were referred to the Comprehensive Care Clinic at Mbagathi Hospital for retesting and HIV care. Children who tested positive and were less than 18months received a confirmatory HIV-DNA PCR test using dried blood

spot specimens that were tested at KEMRI virology laboratory. The figure 2. is a flow chart outlining the clinical procedures for the study.

Figure 2: Flow chart outlining clinical procedures



Qualitative Research Procedures

Enlisting and recruitment

Qualitative data was collected between August 2017 to October 2017. This was achieved through conducting 20 free listing interviews and 2 case studies with caregivers and 12 Key Informant Interviews (KIIs) with health workers. Participants were given the opportunity to review study details and discuss any related questions; written informed consent was obtained, demographic information collected and the interviews conducted. Consent forms for the qualitative study are attached in appendices 10, 11 and 14 while participant forms are attached in appendices 12, 15 and 17.

The interview guide

The Key Informant Interviews were conducted by the principal investigator (PI). The interview guide was developed in a semi-structured style with open-ended questions allowing the participants to openly share personal experiences and the researcher to follow-up where necessary with prompts and probes(47). The follow-up questions were used to generate comprehensive accounts , detailed exploration of attitudes, motivating factors, behaviors, to check views or to generate examples (48).

Prior to conducting the formal interview, the researcher held mock interviews with colleagues to fine-tune the research instrument and make sure the questions were clear and well ordered(49). Opportunity was given at the end of every interview for voicing any relevant views not covered. The interviews lasted about 15-30 minutes.

Piloting

Pilot testing was conducted to detect any limitations in study design, to ascertain how questions would be interpreted, and to assess the researcher's interview skills. This is important especially when a sensitive topic such as HIV/AIDS is discussed. Piloting the interview guide helped to determine if any changes needed to be made to the interview guide such as rewording some questions for greater clarity, rephrasing others into

visualization questions, and inserting additional probes to facilitate more detailed responses(48).

Interviewer technique was assessed and refined in further interviews to ensure participants' responses were completed, before proceeding to the next question. Piloting the interview guide and the interview technique contributed to the validation of the qualitative research process.

Free listing Interviews

Free listing is a systematic data collection method where an informant is asked to list all the different components of an issue of interest. This data collection method was carried out on 20 caregivers to explore the range of perspectives on routinely offered testing. Caregiver responses were recorded on a free listing recording form attached in appendix 9. The form contained 5 questions on motivators or hindrances towards testing, disclosure of HIV test results, concerns that need to be addressed prior to testing and views regarding assent for HIV testing among children.

Case Studies

Two retrospective case studies were done with caregivers. The case studies were used to detail past experiences with routinely offered HIV testing among children who had been tested at pediatric outpatient clinics. The consent form for the caregiver case studies is attached in appendix 10 and 11.

Key Informant Interviews

Key informant interviews (KIIs) are a type of qualitative method where an interview between an informant and interviewer proceeds flexibly much like a dialogue. Key informant interviews of study participants likely to generate 'rich information' were conducted as semi-structured interviews. The consent form for health worker Key Informant Interviews is attached in appendix 14.

Initial questions established rapport between the interviewer and respondent as they focused on general surface level, background and contextual questions and later moved on to in-depth, specific and explanatory questions. Twelve KIIs were conducted with health workers at the various pediatric outpatient clinics. Participants included health workers involved in PITC, management and clinical work and were conducted during break times so as not to interfere with the provision of clinical services.

Ethical Considerations

Ethical approval to conduct the study was obtained from the Kenyatta National Hospital & University of Nairobi Ethics & Research Committee (KNH-UON ERC), the University of Nairobi, Department of Pediatrics & Child Health and Mbagathi Hospital Ethics committee. The appendix 1 contains the ethical approval letter. Facility and departmental heads at Mbagathi Hospital were informed about the study. The study adhered to the core principles of ethics in research which include autonomy, beneficence and justice.

Autonomy means the freedom to decide what to do. A written informed consent was sought from all caregivers and health workers participating in the study and they were made aware that they were free to withdraw from the study at any time, *without giving a reason*. Written assent was sought from children aged 10-15 years to participate in the study with consent from their caregivers. Study participants were encouraged to voice questions or concerns directly with the researcher prior to the interviews and the voluntary nature of participation was stressed.

Beneficence versus maleficence is the principle of maximizing the benefits to an individual or to society while minimizing harm to the individual. The HTS principle of **connection**, referral and linkage to post-test services was observed to ensure beneficence is achieved in this study. All children testing positive for HIV were linked to HIV care, treatment and support services.

A standard referral form was filled for children testing positive for HIV and efforts were made to follow up the clients to determine if they accessed the services referred for and this was documented in the HTS register at the various pediatric outpatient clinics. Those testing HIV negative but still at risk of HIV infection were linked to effective prevention

interventions and those in need of other post-test services such as TB services were linked appropriately.

Justice; the fair selection of research participants and the ideal distribution of risks and benefits was assured in this study by the following:

- Correct information on HIV was given to all caregivers attending the clinics...Pre test and post test HIV counseling was provided for all caregivers who accepted routinely offered HIV testing for their children.
- WHO standardized methodology of HIV testing was adhered to ensure correctness of the results.
- Confidentiality; interviews were conducted in private settings.
- Participant identity was protected in data presentation by the use of pseudonyms and removal of any direct personal identifiers

Data Protection

- Research activities and materials were conducted by and handled by the research team.
- Confidentiality was further protected by immediately transferring interview recordings to a password protected computer/device.
- Digital data was only be handled by the primary researcher and research team members involved in transcription and kept in a secure electronic data storage medium in password protected computers.

Control of Errors and Biases

- Questionnaires and topic guides were piloted and revised accordingly.
- All data was assessed for completeness at source by the PI
- Data entered was crosschecked against the questionnaire to ensure correct entry
- All qualitative interviews were conducted by the PI and all transcripts were reviewed by the PI while listening to the recordings to ensure accuracy.

DATA MANAGEMENT AND ANALYSIS

Quantitative Data Analysis

The outcome measures for quantitative data were:

- The proportion of caregivers consenting to have their children tested for HIV when it was routinely offered.
- Proportion of children testing positive for HIV after their caregivers had consented to routinely offered HIV testing
- The characteristics of children and caregivers in relation to their acceptability or non-acceptability towards routinely offered HIV testing.

Quantitative data was recorded on hard copy questionnaires and transferred to an excel sheet for ease of management. Data was checked for completeness and correctness at source and then edited, coded and entered into an excel sheet and later exported into SPSS 18.0 statistical software for analysis. Double entry was done by the principal investigator before analysis, data was cross-checked for entry errors, cleaned and validated before analysis. To ensure confidentiality all personal identifiers were removed from the data set. Acceptability of routinely offered HIV testing was determined as the proportion of caregivers consenting to the testing of their children. Descriptive analysis was made to explain summary values and characteristics of participants using means and medians for continuous variables and proportions for categorical data. Results are presented in the form of frequency tables, charts and graphs.

The socio-demographic and individual characteristics of children and caregivers associated with acceptability and non-acceptability of testing were assessed. Bivariate logistic regression analysis was done to determine caregiver and child factors associated with acceptability and non acceptability of testing. Bivariate analysis was done and all explanatory variables with an association with the outcome variable with p value less than 0.05 were included in multivariate analysis. Multivariate analysis fitting all these factors using binary logistic regression and by specifying 'backward conditional' progressive stepwise method with removal at $P < 0.05$ was done to determine independent predictors for

HIV testing and counseling acceptance by caregivers. Odds ratio with 95 % CI and p values were used to decide whether the independent variables included in the multivariate analysis were statistically significant or not in relation with outcome variable (acceptance of testing).

Qualitative Data Analysis

Audio recorded interviews were transcribed verbatim and translated as appropriate. The narratives were imported into ATLAS.ti software v8.0 which was used to manage and organize the data. Transcripts were read and re-read to identify preliminary codes. Coding was done by two independent coders who independently coded 3 transcripts simultaneously and then met to revise codes. A code book was developed after coding of seven transcripts. The final code book was validated by a member of faculty and the remaining transcripts were coded using the code book.

Key concepts derived from the codes were grouped together to form categories and subcategories. Linkages were made among the various categories by identifying themes and sub-themes which were charted, mapped and linked to central themes(48). Quotes were used to describe the perceptions and lived experiences of caregivers and health workers towards routinely offered pediatric HIV testing and qualitative findings were triangulated with results from the survey.

Trustworthiness of the Qualitative Study

Trustworthiness of the qualitative study was achieved by assuring credibility, transferability and dependability of the research findings. Peer debriefing (evaluator triangulation) to enhance credibility was done by the research advisors to check consistency of data coding and identify perspectives which may have been overlooked(49). Transferability of findings was facilitated by collecting demographic details and using rich descriptions of the study setting and observed practices to ensure transparency of the entire process to a different study or setting(49).

RESULTS

Between June 2017 and August 2017, a total of 333 child and caregiver pairs from Mbagathi Hospital pediatric outpatient clinics were recruited into the study. The distribution of child caregiver pairs recruited from each clinic was 28, 44, 87 and 174 from the Nutrition, PSOPC / POPC, MCH and OPD clinics at a ratio of 1: 1.6 : 3.3 : 6.5 respectively in accordance to patient distribution in these clinics.

Characteristics of Study Participants

Majority of the caregivers in the study were female (93.4%) and 91% were the biological mothers of the children. The mean age of the caregivers was 29.74 ± 6.76 yrs and 85% were between the ages of 15-35 years. The average number of children per caregiver was 1-2(68.3%) as 91% had a parity of less than 2+0. More than 90% of caregivers were Christian and 77.4% were married and in a monogamous relationship. Approximately two thirds of caregivers (65.8%) had attained secondary and post-secondary education and 64% of them had an average family income of less the 20,000kshs per month.

There was a fairly equal distribution of male and female child participants in the study at 48.4% and 51.6% respectively. The median age of the children was 30.19 ± 33.69 months and 84.6% of them were less than 5 years. About 89.4% of children had less than 2 siblings and 74.6% had a birth order of less than 2. The socio-demographic characteristics of caregivers are presented in table 3 while those of children are presented in table 4.

Antenatal clinic attendance among study participants was universal at 97.9% with 88.4% having more than half of the recommended number of 4 focused ANC visits. Among the 37.1% caregivers who had carried their ANC books, 98.2% had had a HIV test done at antenatal. Previous HIV testing was defined as previous testing done in the past 12 months prior to the study and only 60.1% of caregivers had had previous testing. Caregivers reporting to know their HIV status were 71% while only 39.3% knew their partners HIV status

There were low rates of reported HIV or TB infection among nuclear family members at 3.0% and 1.8% respectively. There were 7 HIV related deaths reported in the family (2.1%) and there was a non - response rate of 13.8% to this question. The disclosure rate of a child and caregivers own HIV test results to a spouse were 84.7% and 83.9% respectively. Only 6.3% of caregivers reported that they needed to ask for permission prior to HIV testing of the child and of these, 63.6% required permission from their spouses. Caregiver responses to HIV related issues are presented in table 5.

Of the 333 children enrolled into the study, only 34.5% of children had a child health card available and 18% had had more than 1 hospital visit in the last 3 months. Approximately a third of the children (27%) were on follow up for a chronic illness. Only 13% of the children were reported to have had previous HIV testing. The main reasons for visiting the hospital were sickness at 52.9% and weight and growth monitoring at 21.6%. With regards to feeding plans 10.8% were still being exclusively breastfeeding while 86.2% had been weaned. Almost all the children (99.1%) had a biological father who was alive and 85.3% of them resided with both biological parents. Caregiver responses to child care related issues are presented in table 3.

Table 3: Socio-demographic characteristics of caregivers

STUDY PARTICIPANTS	N = 333 (%)
CAREGIVER CHARACTERISTICS	
Male	22 (6.6)
Female	311 (93.4)
Mean age of care giver(yrs)	29.74 ± 6.76
Age category	
15-25 years	86 (28.9)
26-35 years	166 (55.7)
Above 35 years	46 (15.4)
Relationship to Child:	
Mother	303 (91.0)
Father	21 (6.3)
Other Relatives	9 (2.7)
Employment:	

Student	6	(1.8)
Employed	88	(26.4)
Not Employed	144	(43.3)
Self-employed	85	(25.5)
Casual laborer	10	(3.0)
Marital Status:		
Single/never married	39	(11.8)
Married monogamous	257	(77.4)
Married polygamous	10	(3.0)
Separated	19	(5.7)
Divorced	3	(0.9)
Widowed	4	(1.2)
Number of Children:		
1-2 children	222	(68.3)
3-4 children	91	(28.0)
5+ children	12	(3.7)
Years of education:		
1-8 years	107	(34.2)
9-12 years	132	(42.2)
Above 12 years	74	(23.6)
Income level category:		
<10000	12	(6.6)
10001-20000	105	(57.4)
20001-30000	49	(26.8)
30001-40000	10	(5.5)
40000 Above	7	(3.8)
Religion:		
Christian	312	(94.3)
Muslim	19	(5.7)
Urban Residence (n=330):	315	(95.4)
Access to TV (n=332)	289	(87.1)
Access to Radio	312	(93.7)
Parity (range 1-7)		
1+0	103	(34.1)
1+1	112	(37.1)
2+0	61	(20.2)
2+1	19	(6.3)
> 3	8	(2.3)

Table 4 : Socio-demographic characteristics of children

STUDY PARTICIPANTS	N = 333 (%)
CHILD CHARACTERISTICS	
Sex:	
Male	161 (48.4)
Female	172 (51.6)
Mean age of the children(mo)	30.19 ± 33.69
Age category	
< 1	136 (40.9)
1-5 years	145 (43.7)
6-10 years	39 (11.8)
>10 years	12 (3.6)
Father Alive:	330 (99.1)
No of Siblings:	
0	105 (31.7)
1	124 (37.5)
2	67 (20.2)
3	23 (7.0)
>4	12 (3.6)
Birth Order:	
1	120 (36.4)
2	126 (38.2)
3	62 (18.8)
>4	22 (6.6)

Table 5: Participant responses to HIV related issues

PARTICIPANT CHARACTERISTICS	N=333 (%)
CAREGIVER CHARACTERISTICS	
ANC Attendance	326 (97.9)
ANC Number of visits	
1	1 (0.3)
2	25 (8.3)
3	116 (38.4)
4+	160 (53.0)
ANC Profile Book Available (n=302)	112 (37.1)
HIV test done at ANC (n=113)	111 (98.2)
Previous admission of caregiver: (n=328)	10 (3.1)
Previous HIV test done on caregiver	200 (60.1)
Knows own HIV status	237 (71.2)
Knows partners HIV status	131 (39.3)
Nuclear family member with HIV	10 (3.0)
Nuclear family member on ART (n=331)	10 (3.0)
Nuclear family member with TB (n=331)	6 (1.8)
HIV related death in family	
Yes	7 (2.1)
No	280 (84.1)
Non-respondent	46 (13.8)
Disclosure of caregivers own HIV test results:	
Spouse	275 (83.1)
Parent	43 (13.0)
Sibling	6 (1.8)
No one	3 (0.9)
Other	4 (1.2)
Need permission for testing:	21 (6.3)
Family member granting permission:	
Own parent	1 (4.6)
Child's parent	5 (22.7)
Spouse	14 (63.6)
Mother in law	1 (4.6)
Reaction if the child is tested for HIV without permission or consent:	
Angry	11 (3.3)
Accepting	311 (93.4)

Indifferent	3	(0.9)
Don't Know	8	(2.4)
Reasons for lack of prior child HIV testing :		
Transport costs	2	(0.7)
Lack of availability of HIV testing	40	(13.8)
No perceived risk of HIV infection	191	(66.1)
Fear of knowledge of HIV status	4	(1.4)
Child too young to be tested	48	(16.6)
Painful to test the child	4	(1.4)
Disclosure of the child's HIV test result:		
Spouse	282	(84.7)
Own parent	38	(11.4)
Parent of child	6	(1.8)
Child's sibling	4	(1.2)
Child care provider	1	(0.3)
No one	1	(0.3)
Other	1	(0.3)

Table 6 : Participant responses to child care issues

PARTICIPANT CHARACTERISTICS	N=333 (%)
CHILD CHARACTERISTICS	
Child Health Care Available:	115 (34.5)
Hospital Admission in last 3 Months:	21 (6.3)
Hospital visit In last 3 Months:	60 (18.0)
Child previously diagnosed/treated for TB (n=330)	2 (0.6)
Number of hospital visits in Last 3 Months:	
0	133 (40.2)
1	107 (32.3)
2	67 (20.2)
3	19 (5.8)
4	4 (1.2)
5	1 (0.3)
Child has Current Illness, on follow up(n=332)	90 (27.1)
Previous HIV Test done to Child:	44 (13.2)
Knowledge of Child's Status:	45 (13.5)
Reasons for visit to health facility:	
Child is unwell	176 (52.9)
Follow up	43 (12.9)
Routine postnatal	1 (0.3)
Immunization	8 (2.4)
Weight and growth	72 (21.6)
Nutrition follow up	33 (9.9)
Current feeding plan	
Exclusive breastfeeding	36 (10.8)
Replacement feeding	1 (0.3)
Mixed feeding	9 (2.7)
Weaned	287 (86.2)
Residence:	
Both biological parents	284 (85.3)
Biological mother	45 (13.5)
Biological father	1 (0.3)
Maternal relatives	1 (0.3)
Paternal relatives	1 (0.3)
Adoptive parents	1 (0.3)

HIV Testing Acceptability

Of the 333 caregivers recruited into the study, 34 (10.21%) were willing to have their children tested, however when testing was offered, only 28 (8.41%) accepted testing for their children as seen in Figure 3 .

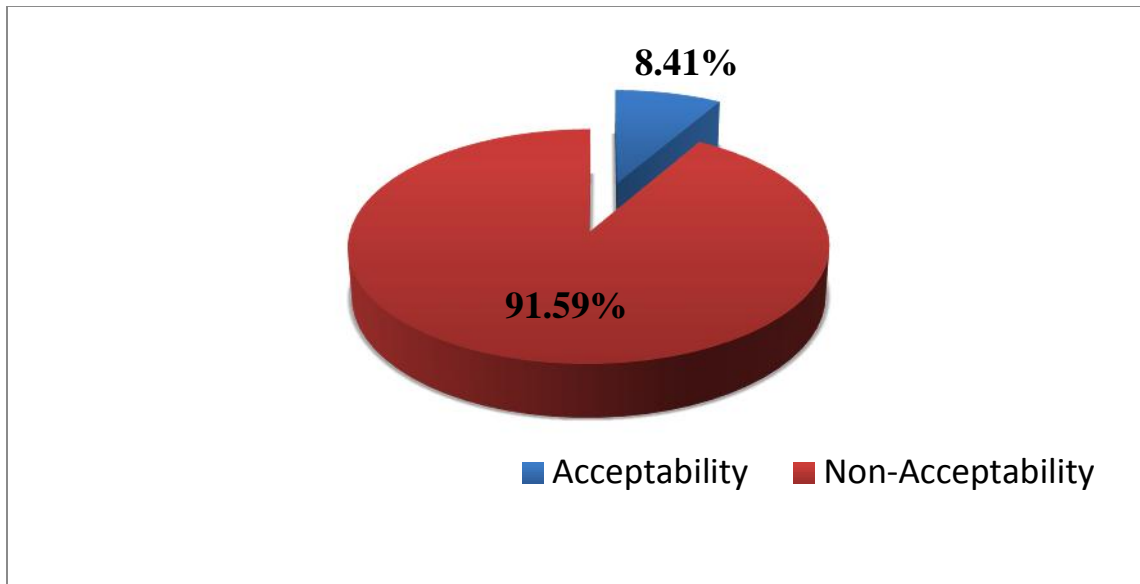


Figure 3: Proportion of children whose caregivers accepted testing

Among caregiver/child pairs consenting to participate in the study only 6.91% of caregivers accepted testing for themselves as shown in Figure 4. The proportion of HIV infection among child/caregiver pairs was 0.04 (1/28) as only one caregiver was found to be HIV positive from the nutrition clinic but the child tested HIV negative as per PCR results. There was a higher proportion of children tested with their caregiver 97.75% (21/28) versus 2.25% (7/28) and this difference was statistically significant ($p < 0.001$) as per the Fischers exact test.

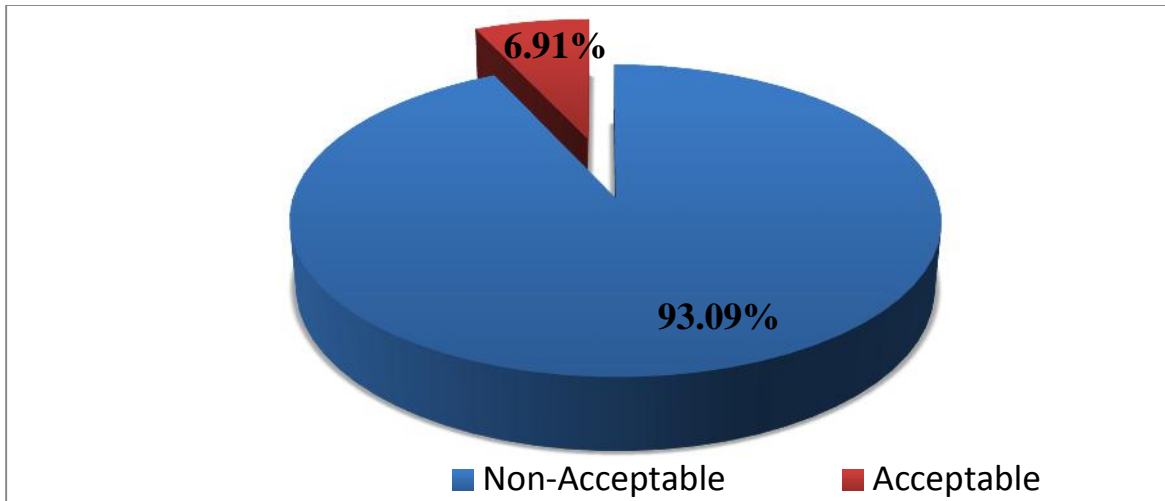


Figure 4: Proportion of caregivers tested

There were varied reasons why caregivers refused testing for their children as seen in Figure 5. There were 205(67.88 %) of caregivers who refused testing because they did not think that their child was infected while 21.19% needed more time to think.

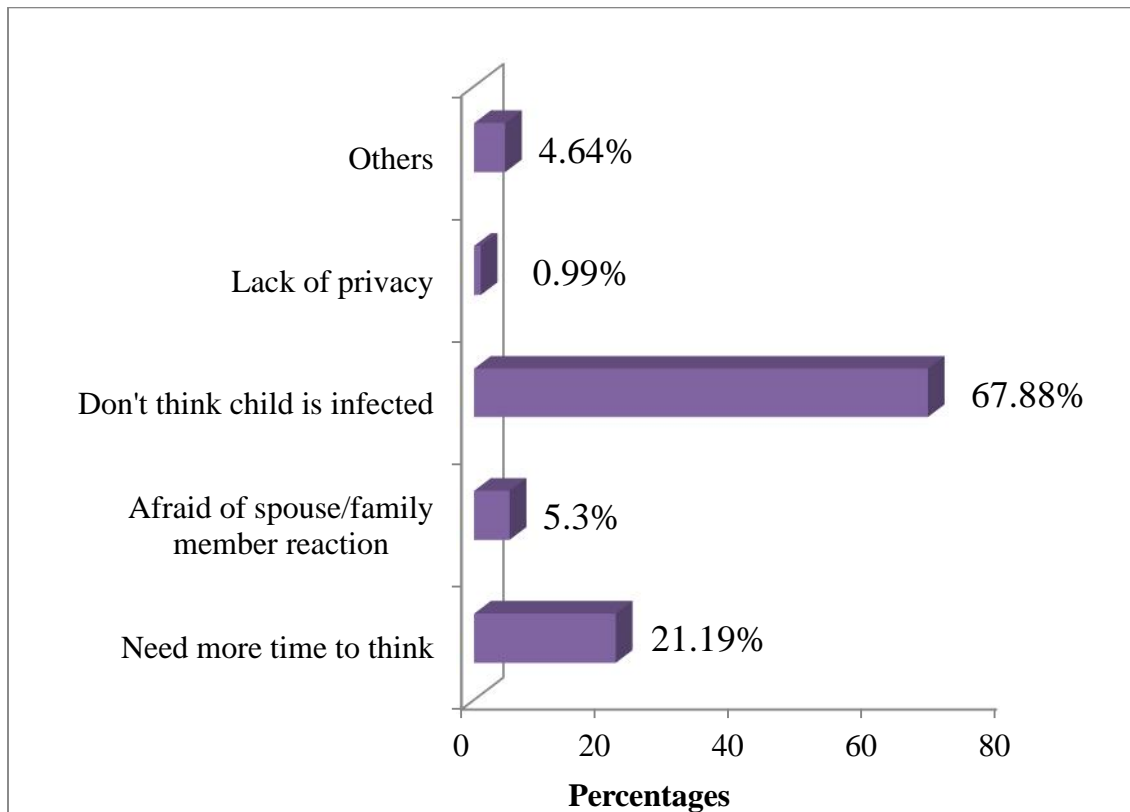


Figure 5: Reasons for not accepting testing when offered

Table 7: Reason for not accepting testing when offered by reason for visit to health facility

Reason for not accepting child HIV testing when offered	Reason for visit to health facility				
	Overall N=303(%)	Unwell N=152	Clinic Follow up N=40	Well Child N=79	Nutrition Follow up N=32
Need more time to think	64 (21.12)	45 (29.60)	1 (2.5)	17(21.52)	0(0)
Afraid of spouse/family members reaction	16 (5.28)	13 (8.55)	1 (2.5)	3(3.80)	0(0)
Don't think child is infected	206(67.98)	87 (57.24)	37(92.5)	51(64.56)	31 (96.88)
Lack of privacy	3 (0.99)	0(0)	0(0)	3(3.80)	0(0)
Other, Specify	14 (4.62)	7 (4.60)	1 (2.5)	5(6.33)	1 (3.13))

As seen in table 7, lack of perceived risk of HIV infection was the most commonly cited reason for not accepting testing among children on clinic follow up; at 96.88% (nutrition clinic), 92.5% (clinic follow up) respectively as opposed to well and sick children at 64.5% and 57.24% respectively.

Table 8: Reason for not accepting testing when offered by the number of hospital visits

Reason for not accepting testing when offered	Number of hospital visits				
	Overall N=303(%)	0 N=124	1 N=97	2 N=60	3-4 N=22
Need more time to think	64 (21.12)	22 (17.44)	26(26.8)	12(20.0)	4 (18.18)
Afraid of spouse/family members reaction	16 (5.28)	8 (6.45)	4 (4.12)	3 (5.0)	1(4.55)
Don't think child is infected	206(67.98)	84 (67.74)	66(68.04)	40 (66.66)	16(72.72)
Lack of privacy	3 (0.99)	3 (2.42)	0	0	0
Other, Specify	14 (4.62)	7 (5.65)	1 (1.03)	5 (8.33)	1(4.55)

A seen in table 8, there was no difference noted with regards to the number of hospital visits and lack of perceived risk of infection as a reason for non-acceptability of testing.

Table 9: Caregiver characteristics associated with acceptability or non-acceptability of testing

Caregiver Characteristics	Accepted Testing N=23	Refused Testing N=310	OR (95%CI)	p-value
Gender				
Male	1(4.3)	21 (6.8)	1	1
Female	22(95.7)	289(93.2)	1.60 (0.20-12.45)	0.7
Age bracket				
15-25 years	3(13.6)	83 (30.1)	1	1
26-35 years	15(68.2)	151(54.7)	2.75 (0.77-9.77)	0.1
Above 35 years	4 (18.2)	42 (15.2)	2.24 (0.43-11.64)	0.3
Relationship to child:				
Mother	22(95.6)	281(90.7)	1	1
Other Relative	1(4.4)	29 (9.3)	0.44 (0.06-3.39)	0.4
Employment status				
Employed	12(52.2)	171/310(55.1)	1	1
Not Employed	11(47.8)	139(44.9)	1.13 (0.48-2.63)	0.8
Marital status				
Single/never married	1(4.3)	38 (12.3)	1	1
Married monogamous	19(82.6)	238(77.0)	3.03 (0.39-23.32)	0.3
Married polygamous	1(4.3)	9(2.9)	4.22(0.24-74.13)	0.3
Separated/Divorced/ Widowed	2 (8.7)	24 (7.8)	3.17(0.27-36.85)	0.4
Number of children				
1-2 children	14(63.6)	208(68.7)	1	1
3-4 children	6 (27.3)	85(28.0)	1.04 (0.39-2.81)	0.9
5+ children	2 (9.1)	10 (3.3)	2.97 (0.59-14.89)	0.2
Years of education				
1-8 years	5 (22.7)	102(35.1)	1	1
9-12 years	10 (45.5)	122(41.9)	1.67 (0.55-5.05)	0.4
Above 12 years	7 (31.8)	67(23.0)	2.13 (0.65-6.99)	0.2
Income level category				
<10000	1(6.7)	11(6.5)	1	1
10001-20000	7(46.7)	98(58.3)	0.79 (0.09-6.99)	0.8
Above 20001	7(46.6)	42(35.2)	1.31 (0.14-11.68)	0.8
Religion				
Christian	20 (87.0)	292/308(94.8)	1	1
Muslim	3 (13.0)	16(5.2)	2.73 (0.73-10.18)	0.1

Residence				
Urban	21 (95.4)	294/308(95.4)	1	1
Rural	1 (4.6)	4(0.6)	0.997(0.13-7.95)	0.9
Access to TV/Radio				
Yes	21 (91.3)	260 (83.9)	2.02 (0.46-8.88)	0.4
Parity:				
1+0	4 (18.2)	99(35.2)	1	1
1+1	10 (45.5)	102(36.3)	2.45 (0.74-8.07)	0.1
2+0	5 (22.7)	55(19.6)	2.25 (0.58-8.72)	0.2
2+1 and Above	3 (13.6)	25(8.9)	2.85 (0.60-13.56)	0.2
ANC Attendance	22/23(95)	304/310(98.1)	0.43 (0.05-3.77)	0.4
ANC Number of visits				
0-2	2 (9.5)	24(8.6)	1	1
3	19 (90.5)	257(91.4)	0.89 (0.19-4.04)	0.9
ANC Profile Book available	7(33.3)	105(37.4)	0.833(0.33-2.13)	0.7
HIV test done at ANC	8/8(100)	103/105(98.1)	N/A	N/A
Previous admission of caregiver	0/22(0.0)	10 /306(3.3)	N/A	N/A
Prior HIV test done on caregiver	19 (82.6)	181/310(58.4)	3.38 (1.12-10.18)	0.030*
Knowledge of own HIV status	18 (78.3)	219/310(70.6)	1.50 (0.54-4.15)	0.4
Knowledge of partners HIV status	11(47.8)	120/310(38.7)	1.464(0.63-3.42)	0.4
Nuclear family member with HIV	0/23(0.0)	10/309(3.2)	N/A	N/A
Nuclear family member on ART	1(4.4)	9 (2.9)	1.51 (0.18-12.46)	0.7
Nuclear family member with TB	0/23(0.0)	6/308(2.0)	N/A	N/A
HIV related death in family				
Yes	1(4.3)	6(1.9)	1.71(0.16-17.96)	0.7
No	18(78.3)	262(84.5)	0.70(0.23-2.19)	0.5
Non response	4(17.4)	42(13.6)	1	1
Disclosure of caregivers own HIV test results:				
Spouse	17(73.9)	258(85.7)	1	1
Parent	4(17.4)	39(13.0)	1.56(0.50-4.87)	0.4
Sibling	2(8.7)	4(1.3)	7.59(1.30-44.41)	0.025*
Need permission for testing	0/23(0.0)	21/310 (6.8)	N/A	N/A
Family member granting permission:				
Own parent	0	1 (4.6)	N/A	N/A
Child's parent	0	5 (22.7)		
Spouse	0	14 (63.6)		
Mother in law	0	1 (4.6)		
Reaction if the child is tested for HIV without permission or consent:				
Accepting	22 (95.6)	289(97.6)	0.53(0.06-4.52)	0.6

As per the bivariate analysis in table 9, among caregivers accepting testing; 19 (82.6%) of 23 caregivers, had previous HIV testing as compared to 181(58.4%) of the 310 caregivers who refused to be tested. Previously tested caregivers were more likely to accept child HIV testing (OR= 3.38; 95% CI, 1.12 – 10.18, p=0.030). Caregivers who opted to disclose their HIV status to their siblings were 7.6 times more likely to accept testing (OR=7.59; 95% CI: 1.30-44.41; p=0.025) as compared to caregivers disclosing their HIV status to their spouse.

Table 10: Child characteristics associated with acceptability or non-acceptability of testing

Child characteristics	Accepted HIV Testing N=28	Refused HIV Testing N=305	OR (95%CI)	P-values
Gender:				
Male	13(46.4)	148 (48.5)	1	1
Female	15(53.6)	157 (51.5)	1.09 (0.50-2.36)	0.8
Age(In Years):				
Below 1	4(14.3)	132(43.4)	1	1
1-5	16(57.1)	129 (42.4)	4.09 (1.33-12.57)	0.014*
6-10	4(14.3)	35 (11.5)	3.77 (0.89-15.84)	0.1
Above 10	4(14.3)	8 (2.6)	16.5 (3.47-78.43)	<0.001*
Father alive	28/28(100)	302/305(99.0)	N/A	N/A
No of Siblings				
0	4(14.3)	101 (33.3)	1	1
1	10(35.7)	114(37.6)	2.21 (0.67-7.28)	0.2
2+	14(50.0)	88(18.5)	4.02(1.27-12.65)	0.018*
Family Order				
1	7 (25.0)	113(37.4)	1	1
2	10(35.7)	116 (38.4)	1.39 (0.51-3.78)	0.5
3	10(35.7)	52 (17.2)	3.10 (1.12-8.61)	0.030*
4+	1(3.6)	21(7.0)	0.77 (0.09-6.57)	0.8
Child Health Card Available	6 (21.4)	109/305(35.7)	0.49 (0.19-1.25)	0.1
Admission in last 3 Months	2(7.1)	19/305(6.2)	1.16 (0.26-5.25)	0.8
Hospital visit in last 3 Months	6 (21.4)	54/305 (17.7)	1.27 (0.49-3.28)	0.6
Hospital visits in last 3 months				
0	9 (32.1)	124(40.9)	1	1
1	10(35.7)	97 (32.0)	1.42 (0.56-3.63)	0.5
2	7(25.0)	60 (19.8)	1.61 (0.57-4.52)	0.4
3+	2(7.2)	22(7.3)	1.25 (0.25-6.19)	0.8
Previous TB infection in child	0(0.0)	2/303(0.7)	N/A	N/A
Child has Current Illness	5 (18.5)	85/305(27.9)	0.59 (0.22-1.60)	0.3

Previous child HIV Testing	3(10.7)	41/305(13.4)	0.77 (0.22-2.68)	0.7
Knowledge of Child's Status	4(14.3)	41/305(13.4)	1.07 (0.35-3.25)	0.9
Residence:				
Both biological parents	26(92.9)	258 (84.6)	2.17 (0.49-9.46)	0.3
Biological mother	2 (7.1)	43 (14.1)	1	1
Other relatives	0	4(1.3)		
Current Feeding Plan				
Exclusive breastfeeding	1 (3.6)	35 (11.5)		1
Weaned	27 (96.4)	260 (85.2)	3.6(0.48-27.59)	0.2
Replacement feeding	0 (0)	1 (0.3)		
Mixed feeding	0 (0)	9 (3.0)		
Child on appropriate feeding plan: (exclusively breastfeeding if <6months):				
Yes	1 (100.0)	35 (71.4)	N/A	N/A
Reasons for lack of prior testing:				
No perceived risk of HIV	13 (52.0)	178(67.4)	1	1
Transport costs	1 (4.0)	1(0.4)	13.69 (0.8 – 231.7)	0.1
Lack of availability of test	6 (24.0)	34(12.9)	2.42 (0.86 – 6.80)	0.1
Fear of knowledge of HIV	1 (4.0)	3(1.1)	4.56 (0.44-47.01)	0.2
Child too young to be tested	4 (16.0)	44(16.7)	1.24(0.39-4.00)	0.7
Painful to test child	0	4(1.5)	N/A	
Disclosure of child's HIV test results:				
Spouse	23 (82.1)	259 (88.7)	1	1
Own parent	5 (17.9)	33 (11.3)	1.71 (0.61-4.79)	0.3
Reasons for visit to health facility:				
Child is unwell	22 (78.6)	154 (50.5)	1	1
Follow up	3 (10.7)	49 (16.1)	0.43(0.12-1.49)	0.2
Weight and growth	2 (7.1)	70 (22.9)	0.20(0.04-0.87)	0.032*
Nutrition follow up	1 (3.6)	32 (10.5)	0.22(0.03-1.68)	0.1

Compared to caregivers of children aged 1 years, caregivers of a child between the ages 1 – 5 years and above 10 years were more likely to accept a HIV test at 16(57.1%) of 28 (OR= 4.09; 95% CI, 1.33 – 12.57, p=0.014) and 4(14.3%) of 28 (OR= 16.5; 95% CI, 3.47 – 78.43, p=0.001) respectively. A child with at least 2 siblings was more likely to be tested as compared to a child with no siblings (OR=4.96; 95% CI, 1.51 – 16.30; p=0.008). And finally, a child in the family order of 3 was more likely to be tested as compared to a child in family order 1(OR=3.10; 95%CI, 1.12 – 8.61, p=0.030). Other caregiver and child characteristics were not associated with increased acceptance of testing.

Table 11: Multivariate analysis of study participant characteristics associated with acceptability towards HIV testing

Participant Characteristics	AOR (95%CI)	p-value
Disclosure of caregivers own HIV test results:		
Spouse	1	1
Parent	1.57(0.50-4.95)	0.4
Sibling	7.60(1.23-46.78)	0.029*
Previous HIV test done on caregiver		
Yes	3.33(1.10-10.12)	0.034*
No	1	1
Age of child(In Years):		
Below 1	1	1
1-5	3.02 (0.76-11.97)	0.1
6-10	2.66(0.47-15.23)	0.3
Above 10	9.85(1.36-71.07)	0.023*
No of Siblings of child		
0	1	1
1	2.60(0.45-14.83)	0.3
2+	3.45(0.41-28.81)	0.3
Family Order of child		
1	1	1
2	0.71(0.15-3.31)	0.7
3	1.38(0.18-10.29)	0.8
4+	0.73(0.03-20.37)	0.9
Reasons for child's visit to health facility:		
Child is unwell	1	1
Follow up	0.50(0.13-1.83)	0.3
Weight and growth	0.61(0.10-3.83)	0.6
Nutrition follow up	0.33(0.04-2.70)	0.3

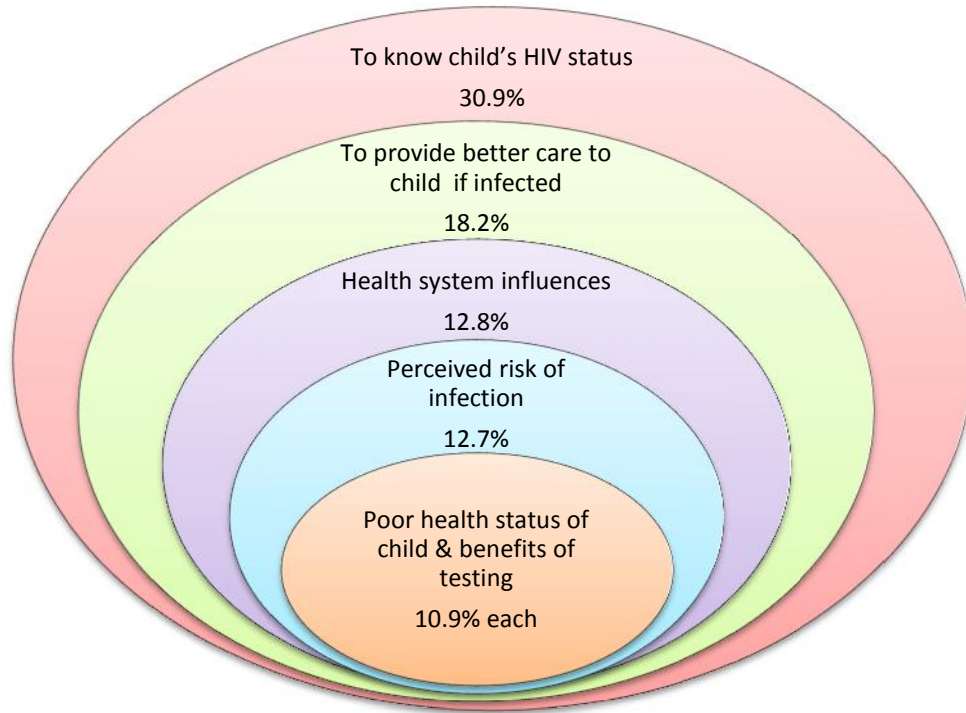
As per the multivariate analysis in table11, caregivers who opted to disclose their HIV status to their siblings were 7.6 times more likely to accept testing as compared to caregivers who chose to disclose their HIV status to their spouse (AOR=7.60; 95%CI: 1.23-46.78; p=0.029). Caregivers with previous HIV testing were 3.3 times more likely to accept testing as compared to those who had not done the test previously(AOR=3.33; 95% CI: 1.10 – 10.12; p=0.034). Children aged above 10 years were 9.85 times more likely to be tested as compared to those less than 1 year(AOR= 9.85; 95% CI, 1.36 – 71.07, p=0.023).

Qualitative Data Analysis

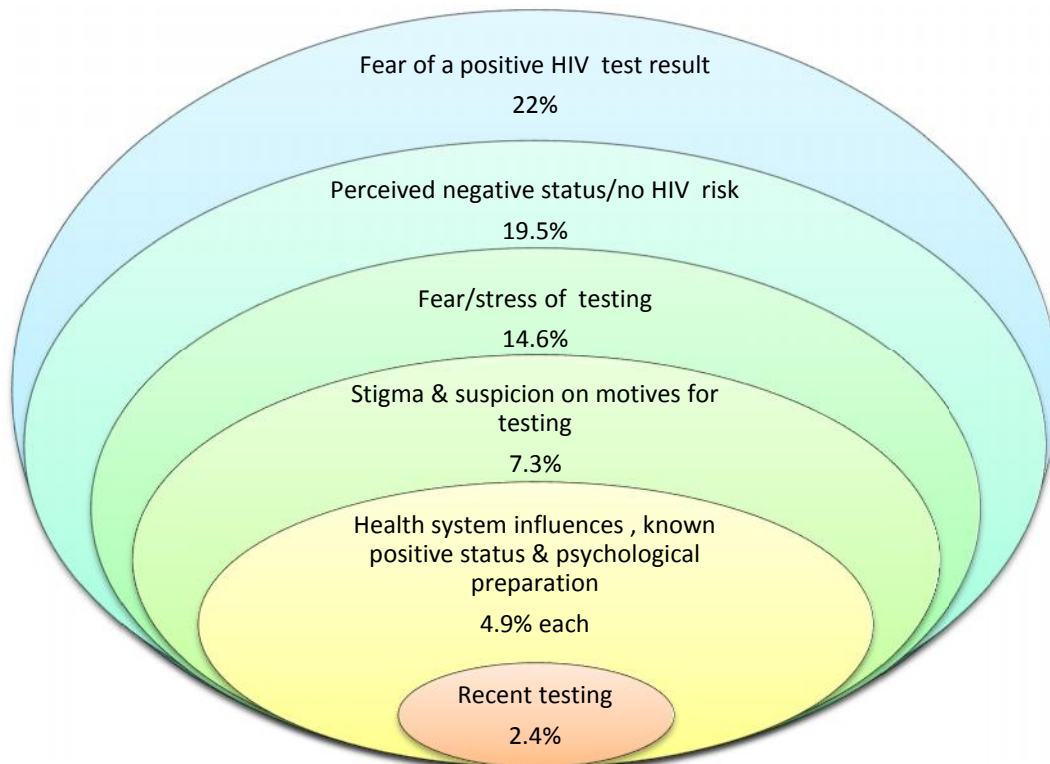
Free Listing Interviews

Among the 20 caregivers included in the free listing interviews, there were 55 varied responses on motivators for child HIV testing. The main reasons for accepting testing were to know the child's HIV status and to provide better care to the child if they were infected. Health system influences that would motivate caregivers to accept testing included good counseling and education, if testing is a health facility requirement and other caregivers and children are also being tested. Perceived risk of infection through breastfeeding, accidents/injuries or from other caregivers like house helps was reported as a motivator for testing by 12.7% (7/55) of caregivers. Caregiver reported benefits of testing which would motivate acceptance of testing included availability of free medication and to avoid stigma if the child is known to be HIV negative. One caregiver reported that they would accept testing if they were confident of their own HIV negative status. The Venn diagram 1. summarizes the motivators for testing among caregivers.

There were 41 varied responses on hindrances for testing. Fear of a positive HIV test result and fear associated with HIV testing were widely reported as hindrances towards acceptance of HIV testing. Perception of a negative HIV status was reported by 19.5%; 8 of 41 caregivers as a reason to decline testing. Health system influences hindering testing were: poor hygiene, testing technique and attitude of health worker. Lack of psychological preparation and concern over level of child's understanding and negative psychological impact of positive HIV results were reported by 2 caregivers (4.9%) as hindrances towards testing as seen in Venn diagram 2.



Venn diagram 1: Motivators for accepting HIV testing



Venn diagram 2: Hindrances towards accepting HIV testing

There were 36 varied responses from caregivers on disclosure of a child's HIV status. 22.2% (8/36) caregivers said that they would disclose their child's HIV test result to the father of the child only while 8.3%(3/36) caregivers said that they would keep the test results to themselves. Cleanliness and use of protective gear during testing was the major concern that 32.5%; 14 of the 43 caregivers who responded, wanted addressed prior to acceptance of testing. Good counseling, privacy and confidentiality was also regarded as important because caregivers wanted to be well prepared for HIV testing and did not want the testing process to be hurried. Other caregiver concerns were that the child should not be too sick, testing should be voluntary, couple testing should be provided and other caregivers and children should also be tested. A summary of caregiver concerns is shown in diagram 3 below.

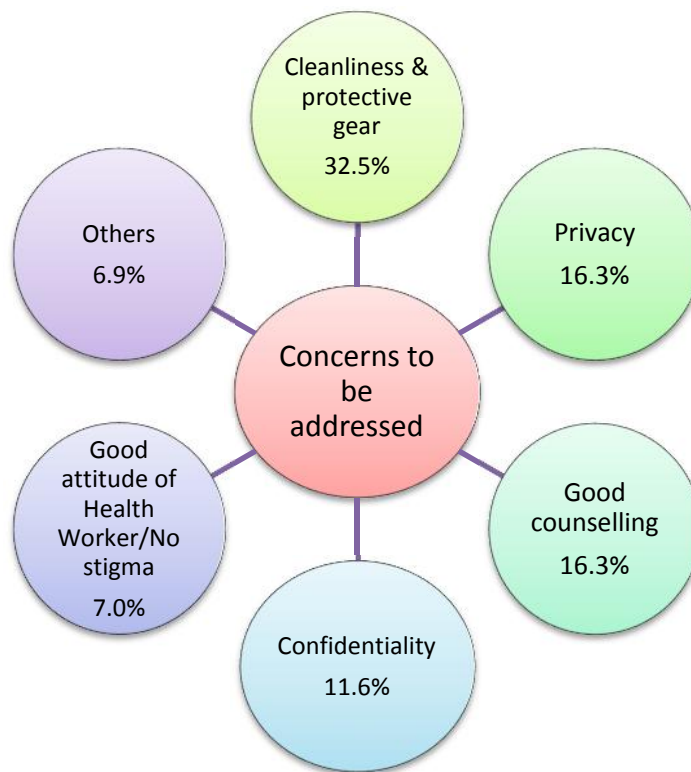


Diagram 3: Concerns that need to be addressed before testing

Majority of views on assent were positive; 18/24 (75%) and only 6/24(25%) of the caregivers were against assent and said that it would hinder them from accepting testing for their children. Negative responses towards child assent included blame/guilt/bitterness on the part of the mother if the child was HIV infected, possible negative effects on the child and fear on the part of the child. Positive caregiver responses towards assent were accompanied by varied perspectives which are described in diagram 4 below.

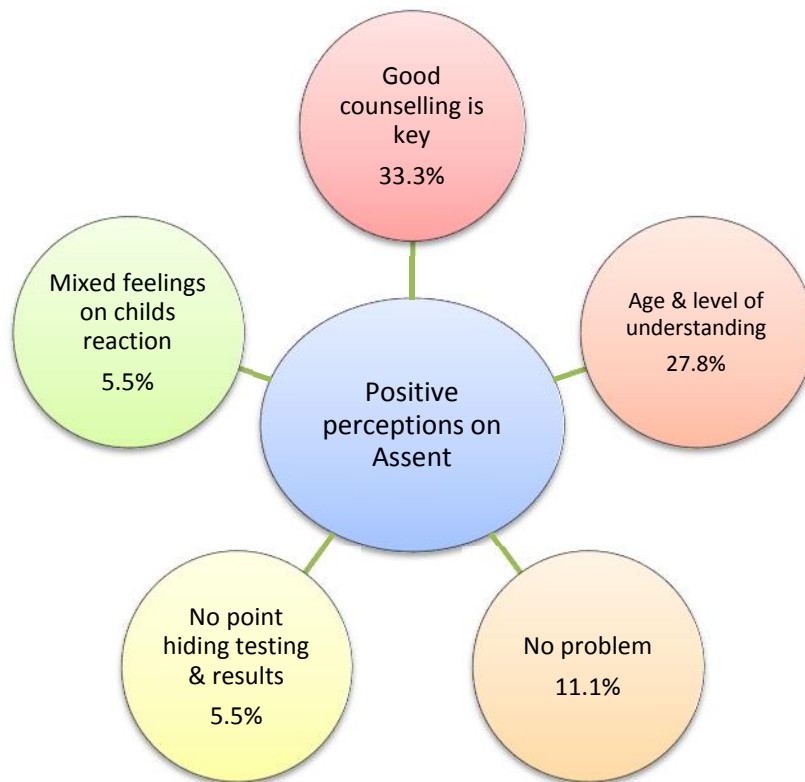


Diagram 4: Caregiver perspectives on assent for children prior to HIV testing

Case Studies

Two case studies conducted with caregivers describe their lived experiences and perceptions towards pediatric HIV testing at the pediatric outpatient clinics.

Case Study 1

A 12 year old boy tested at the pediatric OPD upon referral from a peripheral clinic. He is the second born with an older and younger sibling who are both on treatment. CS1 was first tested for HIV at the age 4 months as an inpatient but the mother was in denial about the results and did not follow up on treatment.

The mother reports HIV testing during pregnancy at 5 months but the results were not disclosed to her. CS1 was weaned at the age of 1 month and did not receive any PMTCT. Despite several reviews in clinics for illnesses such as pneumonia or diarrhea, repeat testing was not offered for CS1 and the mother.

The deteriorating health status of the child prompted the mother to seek a solution and accept testing and enrollment into HIV care. At the time of diagnosis CS1 was 18 months and had WHO stage 3 classification. CS1 was changed to second line of treatment early this year as he was noted to be having virological failure.

Case Study 2

A 14 year old boy tested at the pediatric OPD where he had been seen twice for otitis media and pneumonia before a HIV test was recommended and done. He is the last born and has 3 siblings who are all HIV negative. The mother attended antenatal clinic but reports that she was never tested for HIV.

When CS2 was 6months, the mother was diagnosed with TB but no testing was offered for her or CS2 at the time. When the clinician recommended HIV testing, the mother accepted due to the fact that he was getting recurrent infections. CS2 was tested together with both

his parents who were found to be positive and are all in care. CS2 has been on treatment since 2015 and is currently on first line treatment.

Findings from Case Studies

The main theme identified from the case studies:

Theme : Poor health status of children influences acceptability of testing

Theme : Poor health status of children influences acceptability of testing

The health status of a child influences acceptability towards testing. For CS1, his health status continued to deteriorate and that is what made his mother accept testing. CS2 was seen twice at Mbagathi Hospital before HIV testing was recommended by a health worker and the mother accepted testing because the child was getting recurrent infections.

CS1 Caregiver: 'That time he got worse, when he was 11/2 yrs, he was worse...the child had a different appearance, he was a child but he was appearing as though he was old, when I apply oil on his body it was not sticking to the skin and also he was very thin and again he was not walking...And I had started realizing that truly this child... I had not believed the problem that I had been told, but at this point I had started believing that it could be the one that was disturbing him. So I was forced to go there and that is when they gave me the referral paper that I came with it here. So when we came we were tested again down there....'

CS2 Caregiver: 'Being very sick, flu, chest and some cracks on the ear and pus discharge , so I came so many times in the hospital and at last the doctor told me that if you want us to diagnose the problem of the child go to the VCT. We came with the father and went down there that is where we went so that we can know what is disturbing the child.'

Key Informant Interviews

Demographics of Key Informant Interview Participants

There were 12 key informant interviews conducted with health workers: 1 counselor, 7 clinicians, 1 nutritionist, 3 nurses. Among the participants there were 4 males and 8 females. The mean range of years of practice as a health worker was between 1 year to 10+ years.

More than half of the participants had a degree certificate (7/12) while 4 had a diploma and 1 had a masters degree. With regards to HIV training 8 had received training during the undergraduate years or during seminars or in-service training. Four participants had received HIV training through other specialized HIV training or higher postgraduate study. Most participants had received their last HIV training more than one year ago as 5 received training between 1-2 yrs, 3 between 2-5yrs, 2 more than 5 years ago and only 2 less than a year ago.

Findings from Key Informant Interviews

Four main themes were identified from the qualitative interviews and they are presented in rich descriptions and quotes. The following were the themes:

Theme 1: Challenges of translating policy to practice

Theme 2: Perceptions of HIV risk, status and health

Theme 3: Psychological impact of HIV testing and the role of counseling

Theme 4: Caregiver autonomy versus health worker influence

Theme 1: Challenges of translating policy to practice

Routine pediatric HIV testing is recommended for all patients seen at any government facility irregardless of the purpose of the visit and Mbagathi Hospital is no exception. Mbagathi Hospital policy reflects the same and a sign can be seen in many service points stating the same.

The practice of HIV testing in the pediatric outpatient clinics differs with policy because the main HIV testing strategy used is the targeted testing method and health workers thought that routine testing was not practical.

KII 12: 'It is true but is it practical? Yes, that's what the guideline says but it is not practical....mostly I can observe us we do targeted, where one is sick then they could do a HIV test. Routine has not been very practical'

Routine testing of all children coming to the outpatient was thought to lack a high diagnostic yield.

KII 12: 'If possible routine could be good but if it is not possible then I would go for targeted because when you do routine you might get up to like 90% are HIV negative.'

Routine testing was practiced more in the inpatient than the outpatient setting.

KII 11: 'Well, at least the policy in the hospital for sometime has been to do across the board, everybody who just walks in...For the out-patient I think while that might be the policy, they may not be able to do everybody because of the human resource and maybe sometimes the availability of the kits and all that.'

Time constraints make it difficult to achieve routine testing in the outpatient setting as opposed to the inpatient setting

KII 12: 'And in the ward because there is time. Because even if you don't finish today, tomorrow you will still come and find the patient there, Out-patient they are out-patients, meaning that they will come and go.'

Increased workload negatively impacts on HTS delivery. When there are many clients, filtering is done to decide who gets tested and who doesn't and sometimes testing is not done at all.

KII 6: 'When there are too many patients and maybe you are alone, you are just

avoiding all the investigations you are like, “ I just want to avoid investigations so that I don't have so many people coming back for review”...’

KII 10: ‘Because of the workload here, sometimes we don't ask all of them to be tested. We select.... if we suspect that this child might be suffering from HIV or malnutrition or TB is when we recommend for the testing.....When we meet a child for the first time normally they give us the history, what brought them to the hospital and the issue of testing becomes a secondary issue.’

Staffing shortages affect HTS delivery especially when it relates to the availability of counselors.

KII 6: ‘The biggest challenge is staff because we only have only one person in this unit so when she gets sick or she is not able to come to work for whatever reason then our services are paralyzed.’

Task shifting of HIV testing and counseling to clinicians and other health workers is perceived as not achievable due to increased workload and the time required for counseling.

KII 11: ‘Previously we have always wanted a situation where maybe other cadres like nurses and the doctors, clinical officers can do that work. But the truth is, they are already very busy in the other services they offer....and much as they might have some training on counseling and testing, they are so few that they would like to do the other more core mandate which they are trained in....So they don't want to go into the issue of counseling and testing.’

Targeted testing was considered ideal where there is staff shortage.

KII 12: ‘So targeted I think will be ideal where the staffs are not very many, because if you do routine, you might miss out because at the end of the day you can't capture the 100%. You might miss out whoever needed the test maybe more important than the other. That is what my thinking is.’

There are guidelines on the number of tests that can be done by one counselor in a day which makes it difficult to implement routine testing where the numbers are large.

KII 12: '...The maximum you would test per day is like 20. That is the maximum. That is what is also allowed by the guidelines for testing. So if you were to do, if you were to say you are doing a routine for all, that will not be practical.'

The quality of HIV testing services is compromised when there are many patients and pre and post test counseling is hurried.

KII 4: 'When such things happen.. you don't give quality services to the patients because you are in a hurry to finish the queue so that you don't inconvenience the other work mates, so if it is counseling it doesn't take the required time...'

Space for counseling and testing was limited in some clinics.

KII 11: 'The problem also would be still space because if I were , like in this room now where I see children who are coming for the outpatient clinic , If I wanted to do a HIV test for one and I had a kit here but we share this room with three other clinicians. So will it be appropriate to do counseling and testing? No!'

Testing was not offered in specialty clinics and in some there was little focus on ascertaining the HIV status of children as most clinicians assumed that the test had been done from the referring clinics.

KII 8: 'It's the doctor who sees them first... because by the time they come to this clinic, they just don't land here they come from somewhere...mostly they come from casualty so did that casualty MO or CO take the time to even recommend HIV testing? If they did miss that particular part then even when they come here we will just continue with the story, we will also continue missing that option which was missed in the casualty...'

Routine testing requires an expansion of health infrastructure and for it to be effective there needs to be an increase in the number of counselors, space and staff.

KII 2: 'As we increase, we increase the number of counselors ,we need space for

them. You know counseling is always a process. It takes time. And now the number is increasing. There is no way two counselors can share the same room. And in our counseling we... if you have been there it is only one room. So you need another room and somebody to offer the services.'

Guidelines and policies determine HIV testing practices. A clear framework on timelines for testing children beyond the antenatal period is lacking and would improve the acceptability of testing in the outpatient.

KII 11: '...people also work with things which are not gut feeling I would like to know if your child is coming for immunization or a mother is coming for antenatal care, when should I do the test ? if we do like that it makes the work easier for the clinicians so that they know , it is just like knowing that nine months I give measles , six months I give vitamin A . So if we say at six months do HIV test and it is part of the routine, it will be captured...So it will require the framework of how often it should be done and good keeping of the records. So that if I say I was here two weeks ago and the clinicians can easily get that information they can exempt me .It will also be cheaper for the hospital.'

Theme 2: Perceptions of HIV risk, status and health

Health worker perception of the risk of HIV infection in a child determined whether they would recommend testing or not. The first step in determining risk of HIV infection was to ask about testing during the antenatal period and confirmation using the antenatal booklet. Lack of documentation or child health cards made it difficult to ascertain HIV exposure status as most caregivers did not carry child health booklets or antenatal cards.

KII 3: 'The second challenge is maybe documentation. Because you find sometimes a mother will tell you this child has been tested, but it is not documented even if the child is less than five year.'

The health status of a child determined whether a health worker would consider testing or not. Health workers offered testing based on presenting signs and symptoms.

KII 3: 'No. Not initially. When we realized that the child was not responding we asked the mother, "has this child ever been tested?" We had a concern because when we, most patients that we start on therapeutic feedstake three months. If at all a child takes more than three months then there is no response, then we start thinking outside the box. So that's when we started like, maybe we should do a HIV test, maybe there is an underlying thing. So if at all the mother agreed it would be better but now she refused and she never came back.'

Caregivers who believe they are HIV negative may not see the need for testing their children especially if this was the first hospital visit and the child was not very sick. Most health workers did not prioritize such children for testing due to a perception that they were not infected or that their caregivers would refuse testing. Caregivers of very sick children were more willing to accept testing.

KII 6: 'I was telling you the ones we test because we do targeted most of the time, these mother s have been through so much with the babies and they just want ...and if testing is the solution they go ahead and test. So if we start doing it for everyone, even for the ones who have just had a small cough for the first time in their life I don't think even the caregivers will be so cooperative.'

Theme 3: Psychosocial impact of testing and the role of counseling

The psychosocial impact of HIV testing and consequences of a positive HIV diagnosis emphasize the role of counseling. There was caregiver anxiety associated with HIV testing and the possibility of a positive HIV test result and many had questions as to why testing was being done.

KII 4: ' " Why do you want to do a HIV test for my child?", "am sure am okay", "where could my child have gotten HIV from?" .Those are the basic questions they just ask at first.'

Clients who initially refused testing in the consultation rooms would later accept testing after receiving counseling.

KII 2: ' They talk with the counselor . If they undergo the counseling and they

end up declining, well and good. But some of them they can decline when they are in a clinical setting, but when they are talked to by the counselor they have a change of mind.'

Counseling is critical for good outcomes of HIV infected children.

KII 12: '..So as much as many times many medical people want counseling out, it is not possible to live without counseling, otherwise you can get your status, you get your number but how this person is left? But now if you are dealing with pediatrics you are dealing with a family you are dealing with a father and a mother here and a child here, so if you tell them that they are positive how are they going to stay in that home?'

Counselors are few as compared to the number clients requiring testing and often times they have to balance counseling and other duties that they have.

KII 7: 'Work load, it becomes so much when am combining the psychiatric...I am a psychiatric trained nurse, so I have to combine this with the HIV testing.'

Theme 4: Caregiver autonomy versus health worker influence

HIV testing is voluntary and caregiver consent is required. Caregivers cannot be forced to accept testing and this is a dilemma for health workers. There were varied reasons for caregiver refusal of child testing.

R7: 'Like now if a child is going to the ward it is a must you have to do the test. At times it becomes very difficult to convince the care giver or the mother the need of giving a HIV test to a child....some of them they don't understand how the HIV is being transmitted from one person to another person. So, it's like they wonder how, how can a child be having HIV?....some of them maybe they are not ready to go for the test, maybe they have done it somewhere else and they were told and they didn't want to compare with what they were told, so when you want to do it again to them it is a challenge.'

Clinicians determine who gets tested and sensitization of health workers to recommend testing is needed to improve acceptability of testing.

KII 12: '...the clinicians to send people as many as possible because they determine a lot who will be tested, so if they don't send you can't pull them out..'

DISCUSSION

In this study we assessed the proportion of caregivers accepting testing for their children at Mbagathi Hospital pediatric outpatient clinics. The acceptability of child HIV testing was low at 8.41% and 6.91% for the caregivers. The yield for HIV testing in this study was also low as there was only one HIV infected caregiver but no HIV infected infant. Findings from this study are much lower than those reported in Zimbabwe at 54%(33) and South Africa at 52%(32) which had much lower findings than those found in Zimbabwe at 95%(50) after implementation of routine opt out testing . Of note is that the above studies had much larger sample sizes than the sample size in this study. The HIV testing rates for children seen in outpatient clinics has also been reported to be as low as 30% (51) in Tanzania emergency department units.

Factors affecting the acceptability of routinely offered pediatric HIV testing from this study were: perception of risk of HIV infection , health system influences, counseling and social support and health resources constraints.

Lack of perceived risk of infection was the most common reason for non-acceptability of HIV testing by 67.3% of caregivers. Free listing interviews showed that perceived risk of infection was both a motivator and a hindrance towards the acceptability of testing.

Perceived risk of HIV infection was associated with the health status of a child which influenced acceptability of testing. Caregivers of children with poor health status were more likely to accept or consider testing as opposed to caregivers of children in good health. Poor health status of a child was more of a motivator than a hindrance for testing and the major reason why caregivers in the case studies accepted testing for their children.

Poor health status of a child was also a motivator for health workers to offer HIV testing to children because they would use presenting signs and symptoms to decide which children would get tested. Targeted as opposed to routine testing was the preferred HIV

testing method and what was commonly practiced. In the event of recurrent hospital visits, deteriorating health status and non-response to treatment, HIV testing would be offered.

Several studies have shown that lack of perceived risk of infection is the major reason for non-acceptability of testing. A systematic review on factors enabling and deterring uptake of HIV testing in sub-Saharan Africa showed that deterioration of physical health and ,or death of sexual partner or child were motivators for testing and perceived low risk of infection was a barrier to testing(39). The availability of HAART was an incentive for testing in this study while fear of HIV related stigma was a barrier similar to findings from the systematic review(39). In this study, older children were more likely to be tested as opposed to findings from Zimbabwe where older children were unlikely to be tested(33). In the Zambia study, testing was initiated primarily because of ill-health of the child or with parents/caregivers suspecting an HIV infection as the underlying cause (58.7%)(52).

Health system factors influencing the acceptability of testing included factors related to caregiver interaction with the health system such as previous HIV testing. Women with previous HIV testing in the last 12 months were more likely to accept HIV testing than those who had not had previous testing as seen from the survey. This is an important aspect in pediatric HIV prevention because HIV testing among women of child bearing age is one of the four prongs of prevention of HIV infection in children as recommended by WHO.

Health system influences that were motivators for testing included health facility requirements where testing was offered to everybody. Opt out testing which attenuates fear of HIV related stigma has been reported to increase acceptability of testing(39). Poor hygiene, testing technique, attitude of health workers and lack of proper counseling was reported to hinder acceptability of testing.

Counseling was integral to the acceptability of testing and good outcomes after testing. Privacy, good counseling and confidentiality were some of the concerns that caregivers wanted addressed before they could accept testing. Perceived health workers inability to

maintain confidentiality has been cited as a barrier towards acceptability of testing(39). Lack of psychological preparation and concern over level of a child's understanding and negative psychological impact of positive HIV results were reported as hindrances towards testing from the free listing interviews. Counseling was regarded as especially important when it came to assent for testing among children above 10 years although some caregivers said that they would decline testing if assent was a requirement.

Social support for caregivers especially from family members such as siblings is important because caregivers who were willing to disclose their HIV status to a sibling were more likely to accept HIV testing for their children as seen from the survey. Stigma and fear of the consequences of a positive HIV status were still reported as hindrance towards testing. Availability of a social network influence and support has been reported as an enabler for testing(39) while family conflict(52), fear of HIV related stigma and perceived psychological burden of living with HIV were reported as barriers for testing(52)(39).

Health resource constraints such as staffing shortages in the setting of increased workload ,unavailability of counselors, space, rooms and kits for HIV testing and counseling continue to be major setbacks towards the implementation of routine testing in the outpatient setting. In Zimbabwe health workers complained of increased workload, insufficient space for counseling, too few counselors, long client waiting times and stock outs (33)while in Namibia, nursing shortages were reported as barriers to implementation of routine testing(52).

One of the strengths of this study is that both quantitative and qualitative methods were used to determine the acceptability of testing and explore perspectives of both caregivers and health workers who are vital to the success of routine testing in children. This study utilized routine HIV testing strategy which is the HIV testing strategy recommended by the WHO as opposed to the targeted testing strategy. PITC testing approach was used in this study as opposed to family centered approach, the former has higher acceptability rates as opposed to the latter.

The qualitative arm of the study utilized various qualitative research methods and the analysis was done in a rigorous manner by two independent coders plus a member of faculty who validated the codes. This adds strength to the validity of the findings from the qualitative study.

A major limitation of this study is that it was carried out at Mbagathi Hospital pediatric outpatient clinics and the findings may not be generalized to patients in an in-patient setting, tertiary level facilities or the whole country. The study was also carried out during a period when there was an on-going nurses' strike and the reason why there were very few of them included in the key informant interviews.

Conclusion

There is low acceptance of routine pediatric HIV testing in the outpatient setting mostly because caregivers do not perceive their children to be at risk of HIV infection. Child HIV testing is more acceptable to caregivers and health workers when there is ill health or high suspicion for HIV infection due to presenting signs and symptoms or frequent visits to the hospital.

Health workers prefer targeted approach of HIV testing citing inadequate human resources as a constraint. Caregivers with previous HIV testing and a family support as evidenced by willingness to disclose their own HIV status to their siblings, are more likely to accept child HIV testing.

Recommendations

In order to improve HIV testing uptake, perception of low risk of HIV infection will have to be addressed. Increased awareness of the risk of HIV infection in asymptomatic children is needed. Caregivers and health workers need to be sensitized on the benefits of routine testing in identifying HIV infected children before deterioration of their health status.

Routine testing of infants seen in the nutrition clinic should be prioritized as a possible high yield strategy in the outpatient clinic as the only HIV positive case in this study was from this clinic. Health education should be given to caregivers on the association of HIV and malnutrition because majority of those attending nutrition clinics 96.88% declined testing because they did not think that their child was infected.

Maternal re-testing among children seen in the MCH clinic should be reinforced in order to pick up children who acquire infection during breastfeeding. Rapid tests for children during the 18month visit may be an opportunity to capture these infants for testing and link them to PMTCT. HIV testing should be offered to women of child bearing age at various service points such as adult clinics or family planning clinics.

Routine pediatric HIV testing in Mbagathi Hospital pediatric outpatient clinics requires an expansion of the health infrastructure, human resources and change in the testing strategy used. Incorporating routine opt out HIV testing into triage and as a requirement for every clinic visit may improve acceptability. Proper documentation of HIV testing and test results will limit unwarranted testing and save costs. Health workers need ongoing on the job training on HIV testing and counseling. The number of HTS counselors should be increased to increase coverage at night and during the weekends.

Dissemination of Study Findings

A manuscript of this study will be written and submitted to peer reviewed journals for publication and presentation at conferences and meetings with NASCOP and the MOH. Results will also be availed to health workers at Mbagathi Hospital, students and faculty at the University of Nairobi.

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APPENDICES

Appendix 1: Ethical Approval



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25th April 2017

Dr. Grace Juan Soma
Reg. No.H58.75539/2014
Dept. of Paediatrics and Child Health
School of Medicine
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Dear Dr. Soma

REVISED RESEARCH PROPOSAL - THE ACCEPTABILITY OF ROUTINELY OFFERED PEDIATRIC HIV TESTING AT MBAGATHI HOSPITAL PAEDIATRIC OUTPATIENT CLINICS (P107/02/2017)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above revised proposal. The approval period is from 25th April 2017 – 24th April 2018.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

"Protect to Discover"

Appendix 2: HIV Counseling Information

<p>Introduce yourself and the session.</p>	<p>I am _____ (name/occupation) and will be talking with you about HIV testing for your child. Please feel free to ask questions today so you have the information you need.</p>
<p>Provide general information on HIV</p>	<p>HIV is a virus that interferes with the immune function of the body. HIV is transmitted through sexual intercourse, contact with blood and blood products and through an infected mother to her child. If a mother has HIV infection, the infection can be passed on to her child during pregnancy, during childbirth and after delivery by breastfeeding.</p>
<p>Discuss the reasons why HIV testing and counseling is recommended</p>	<p>HIV testing for children is routine in Kenya. This means that HIV testing is recommended for all children as a normal part of their health care. In order to know if a child is infected or not, HIV testing is needed.</p>
<p>Discuss the benefits of testing and counseling.</p>	<p>It's important to know the HIV status of your child to provide your child with the best care available. There is no cure for HIV, but HIV treatment is available. Treatment lowers the risk of getting sick or dying from HIV, and many people on treatment are living long, healthy lives. Children with HIV infection who are not treated can become very ill quickly. Because HIV disease can get worse quickly in children, it's important that we identify HIV infection in children as early as possible so that the child can be protected and treated. Knowing your child's HIV status helps you and your family to plan your future together.</p>
<p>Discuss confidentiality</p>	<p>The result of the HIV test is confidential; it is shared only with those professional healthcare workers who need this information in order to care for your child. When your child's result is ready, we will talk with you in private to give you the result and explain what the result means.</p>

	<p>We will also talk about and arrange for the care that you and the child need. We will answer any questions you have.</p>
Describe how the test is done.	<p>This test is called a rapid HIV antibody test and it is done with just a few drops of blood. A very small needle is used to prick either your child's heel, toe or finger. The results of the test are ready in less than one hour.</p>
Describe the meaning of test results.	<p>The meaning of the test result depends on the age of the child and whether or not the child is breastfeeding.</p> <p>If your child is less than 18 months of age or is breastfeeding, it may be necessary to do more testing to know the child's HIV status. Even if more tests need to be done, knowing the results of the first test will help you to plan care and follow-up for your child.</p> <p>If your child is more than 18 months of age and has not been breastfeeding, then the HIV antibody test will tell us your child's HIV status.</p> <p>A positive test means that your child has HIV and needs treatment. A negative test means that your child does not have HIV.</p> <p>For the mother, a positive HIV antibody test in a child usually means that the child's mother is HIV-infected. Some mothers may already know their status. If you do not know your status, let us know.</p> <p>We can offer you an HIV test today, along with your child so that you are sure.</p>
Discuss the availability of care and treatment.	<p>Remember: HIV treatment works and people living with HIV can lead long and healthy lives.</p> <p>This is why we are asking you to get your child tested and why doctors and nurses recommend testing for your children.</p> <p>If you have or your child has HIV infection, we will arrange for you to receive the support, care and treatment that you need.</p> <p>Treatment for HIV is available and is free for adults and children.</p>

	<p>We will also help you learn about HIV and HIV treatment, to care for yourself and your child at home, help you with a follow-up plan and provide ongoing support.</p>
<p>Discuss the right to decline the test.</p>	<p>HIV testing is strongly recommended for all children in Kenya because it allows children with HIV to access life-saving treatment. You have the right to tell us that you do not want your child to be tested.</p> <p>If you say no to the test, we will still take care of you and your child. We will also try to address your concerns about HIV testing.</p> <p>However, if your child has HIV and your child's doctor does not know about it, your child's health may be endangered.</p>
<p>Close the session.</p>	<p>Are there any questions?</p> <p>What concerns do you have about HIV testing for your child?</p> <p>HIV testing is a regular part of child health care.</p> <p>As part of your child's care today we will test her or him for HIV.</p> <p>If you have a question or information you would like to share privately, you will be able to do so before the test is performed.</p>

Appendix 3: HIV Test Description and Results Interpretation

The Alere Determine HIV-1/2 is an in vitro, visually read , qualitative immunoassay for the detection of antibodies to HIV-1 and HIV-2 in human serum, plasma or whole blood. The Alere Determine HIV-1/2 test has a sensitivity of 100.00% and a specificity of 99.75%.

Positive result

Red bars appear in both the control window and the patient window of the strip. Any visible red bar in the patient window should be interpreted as positive.

Negative result

One red bar appears in the control window of the strip, and no red bar appears in the patient window of the strip.

Invalid result

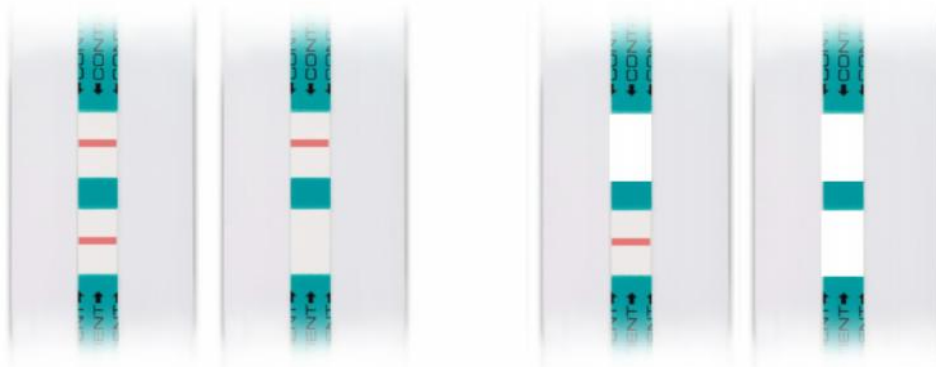
If there is no red bar in the control window of the strip and even if a red bar appears in the patient window of the strip, the result is invalid and should be repeated.

Wait 15 minutes and read the results. Do not interpret after 1 hour.

POSITIVE

NEGATIVE

INVALID



Appendix 4: Caregiver Consent Form for Interviews (English)

Introduction

Grace Soma, a postgraduate student at the Department of Pediatrics and Child Health, University of Nairobi is conducting a study on HIV testing in children. This research is part of the requirements for qualification with a Masters of Medicine degree in Pediatrics and Child Health at the University of Nairobi.

When you came to the clinic today you received information on Human Immunodeficiency Virus (HIV) and I have also been able to have a one on one discussion with you on the same. We discussed what HIV is, how it is transmitted and how it affects health leading to opportunistic infections. We also discussed how HIV is diagnosed and that although there is no cure there is a package of care available to keep HIV infected children healthy. This includes antiretroviral treatment (ART), cotrimoxazole to prevent infections which are common in HIV infected people, a balanced diet, updating immunizations, treatment of opportunistic infections, regular monitoring of growth and development and counseling to help the affected person to deal with HIV associated problems. This package of care is available at the CCC in Mbagathi Hospital.

HIV infection among children is common and it is not easy to tell whether a child is infected or not by general examination. The Ministry of health and WHO recommend establishing the HIV exposure status of all children by 6 weeks week of age or at first contact with a health worker irregardless of the purpose of their visit to the health facility. HIV testing is being offered as part of the care package during your visits to health facilities including this clinic. The aim of this study is to find out what your views are concerning this and what factors influence your decisions.

I want to offer you the opportunity to be part of this study. I am going to give you information on the study and invite you to be part of the study. Please feel free to ask any questions.

Study title:

THE ACCEPTABILITY OF ROUTINELY OFFERED PEDIATRIC HIV TESTING AT MBAGATHI HOSPITAL PEDIATRIC OUTPATIENT CLINICS.

Study Procedures

If you accept to participate in the study, I will ask you some questions about you and your child. After this, there will be an opportunity for an HIV antibody test to be carried out on your child.

If you are willing and would want to know the HIV test result, I will clean the left ring finger three times using three different spirit swabs. I will then prick the fingertip off centre. The first drop of blood will be wiped away using a sterile gauze pad and I will then draw a few drops of blood and test it. The results will be ready after 15 minutes.

I will let you know what the results are. If the test result is negative your child shall continue with routine care at the clinic.

If the test result is positive, cotrimoxazole prophylaxis will be started on the child if he or she is at least 6 weeks old and another sample will be drawn for a confirmatory PCR/DNA test. You and your child will be referred to the CCC of Mbagathi Hospital for registration and follow up. If the confirmatory DNA/PCR test is positive your child will be started on ART and this will be done in the CCC at Mbagathi Hospital.

Risks

A little pain with the prick.

I will ask some questions which might be personal but you are under no obligation to answer any questions which you find uncomfortable.

HIV testing for your child might cause some anxiety and the finger prick to draw blood may be painful causing the child to cry.

Benefits

Knowing the child's HIV status will enable the child to get appropriate management.

Your participation in this study will help generate information that will help other children in the future even if your child does not directly benefit from this study.

Compensation

No incentive or compensation will be given to you for participating in the study.

Cost

The HIV test carried out in this study will be done at no cost to you.

You will not incur any extra costs by participating in the study.

Confidentiality

The information that you disclose during the interview and the results of antibody testing will be highly confidential. They will only be shared with the clinician at the clinic for the child's benefit in terms of treatment and care.

Voluntary participation

Your participation in this study is entirely voluntary. You may withdraw from the study at any point without explanation or consequence and the management of your child will in no way be interfered with.

CONSENT FORM

I confirm that I have read and understood the above information about the study. I have had the opportunity to ask questions. I agree to take part in the above study.

Caregiver's name.....

Child's name.....

Signature of caregiver..... Date

I.....declare that I have explained to the participant the study purpose and procedure. I have also allowed the participant to ask questions regarding the study.

Researcher's name.....

Research assistant name (if applicable).....

Signature.....

Date.....

Appendix 5: Caregiver Consent Form for Interviews (Swahili)

TARATIBU ZA MAELEZO KWA MSHIRIKA

Utangulizi : Grace Soma, mwanafunzi uzamili katika Idara ya Pediatrics na Afya ya Mtoto, Chuo Kikuu cha Nairobi anafanya utafiti juu ya kupima virusi vya ukimwi kwa watoto. Utafiti huu ni sehemu ya mahitaji ya kufuzu kwa wa tiba shahada katika Pediatrics na Afya ya Mtoto katika Chuo Kikuu cha Nairobi.

Wakati ulikuja kliniki leo ulipokea taarifa juu ya Virusi vya Ukimwi (VVU) na mimi pia nimeweza kuwa na mjadala mmoja kwa mmoja na wewe kuhusu jambo hili. Tulijadili virusi vya ukimwi ni nini, jinsi unavyoambukizwa na jinsi unaathiri afya na kusababisha magonjwa nyemelezi. Pia, tulikuelezea ya kwamba, ingawa hakuna tiba kuna mfuko wa huduma inapatikana ya kuweka watoto walioambukizwa virusi vya ukimwi na afya. Pamoja na tiba ya kupunguza makali (ART), kuna cotrimoxazole ya kuzuia maambukizi ambayo ni ya kawaida kwa walioathiriwa na virus vya ukimwi. Mfuko huu wa huduma inapatikana katika CCC ya Mbagathi Hospital.

Maambukizi ya virusi vya ukimwi miongoni mwa watoto ni jambo la kawaida na si rahisi kujua kama mtoto ameambukizwa au la kwa mitihani ya ujumla. Wizara ya afya na WHO inapendekeza kutambua hali ya kuathiriwa na virusi vya ukimwi kwa watoto wote waliotimiza wiki 6 ya umri au katika kuwasiliana ya kwanza na mfanyakazi wa afya bila kuzingatia sababu ya ziara yao kwa kituo cha afya.

Lengo: Lengo la utafiti huu ni ya kujua nini maoni yako juu ya kupima virusi vya ukimwi kwa watoto na nini sababu ambazo zinaweza kushawishi maamuzi yako. Nataka kukupa fursa ya kuungana nasi kwa utafiti huu. Nitakupatia maelezo kuhusu uchunguzi wangu na ninakualika uwe mmoja wa washirika. Tafadhali jiskie huru kuuliza swali lolote lile.

Utaratibu : Ukikubali kushiriki katika utafiti huu, utaulizwa maswali machache na majibu yako yatajazwa katika dodoso. Baada ya maswali, kutakuwa na fursa ya kupima virusi vya ukimwi kwako na kwa motto wako.

Kama uko tayari na unataka kujua matokeo ya mtihani wa kupimwa virusi vya ukimwi, mimi nitasafisha kidole cha pete cha mkono wa kushoto mara tatu. Nami kisha nitachoma kidole mbali katikati, kama ni inavyofanyika wakati wa kuchukua damu ya mtihani wa kupima vimelea vya malaria. Matokeo itakuwa tayari baada ya dakika 15. Nitakujulisha matokeo ya mtihani huu. Kama matokeo ya mtihani ni hasi mtoto wako ataendelea na utaratibu wa huduma katika kliniki.

Kama matokeo ya mtihani ni chanya, cotrimoxazole prophylaxis itakuwa kwanza ya madawa ambayo yataanzishwa kwa mtoto wako kama ametimiza wiki 6 na sampuli nyingine itatolewa kwa ajili ya mtihani wa confirmatory PCR / DNA. Wewe na mtoto wako mtapelekwa CCC ya Mbagathi Hospital kwa ajili ya usajili na kufuatilia. Kama matokeo ya mtihani wa DNA / PCR ni chanya, mtoto wako atapatiwa ART na hii itafanyika katika CCC ya Mbagathi Hospital.

Hatari: Naweza kukuuliza baadhi ya maswali ambayo inaweza kuwa binafsi lakini wewe ni chini ya wajibu wako kutojibu maswali yoyote ambayo unaweza kupata wasiwasi. Kupima virusi vya ukimwi kwa mtoto wako inaweza kusababisha baadhi ya wasiwasi na chomo kidole kuteka damu inaweza kuwa chungu na kusababisha mtoto kulia.

Faida: Kujua hali ya kuathiriwa na virusi vya ukimwi wa motto wako itamwezesha kupata matibabu mwafaka. Ushiriki wako katika utafiti huu utasaidia kutoa taarifa ambazo zitasaidia watoto wengine katika siku zijazo hata kama mtoto wako hatafaidika moja kwa moja na utafiti huu.

Malipo: Kushiriki katika utafiti huu hakutakuwa na malipo yoyote kwa mshiriki.

Gharama: Hatalipishwa gharama yoyote ya ziada kwa kushiriki katika utafiti.

Usiri: Ujumbe wowote ambao utakusanywa utakuwa wa siri. Daktari wa kliniki hii pekee ndiye atakayeelezewa matokeo ya vipimo vya virusi vya ukimwi kwa manufaa ya mtoto katika suala la tiba na matunzo.

Ushirika wa hiari : Ushiriki wako katika utafiti huu ni hiari kabisa. Unaweza kuondoka kutoka utafiti katika hatua yoyote bila maelezo au madhara yoyote kwa tiba na matunzo ya mtoto wako.

TARATIBU YA IDHINI / RUHUSA

Nimesoma na nimeelewa kabisa taarifa kuhusu utafiti huu. Nimekuwa na nafasi ya kuuliza maswali na yamejibiwa kwa ukamilifu. Nimekubali kushiriki katika utafiti huu.

Jina la Mzazi/Mchungaji wa mtoto.....

Jina la mtoto.....

Sahihi ya Mzazi/Mchungaji wa mtoto:

Tarehe:

Miminabaini kwamba nimeeleza mshiriki lengo na utaratibu wa utafiti. Na nimempa mshiriki nafasi ya kuuliza maswali yoyote.

Jina la Mchunguzi au Mchunguzi msaidizi.....

Sahihi.....Tarehe.....

Kama kuna swali lolote, jiskie huru kuwasiliana nami.

Appendix 6: Child Assent Form for Interviews (English)

Grace Soma, a postgraduate student at the Department of Pediatrics and Child Health, University of Nairobi is conducting a study on HIV testing in children. We are asking you to take part in a research study because we are trying to learn more about how acceptable routine HIV testing is for children receiving health services at the pediatric outpatient clinics here at Mbagathi Hospital.

If you agree to be in this study, I will ask some questions about you and your caregiver. After this, there will be an opportunity for an HIV antibody test to be carried out on you.

If you are willing and would want to know the HIV test result, I will clean the left ring finger three times using three different spirit swabs. I will then prick the fingertip off centre. The first drop of blood will be wiped away using a sterile gauze pad and I will then draw a few drops of blood and test it. The results will be ready after 15 minutes.

I will let you know what the results are. If the test result is negative you shall continue with routine care at the clinic.

If the test result is positive, we shall give you some medicines and conduct further tests to confirm the test that we have carried out today. We will refer you and your caregiver to the CCC of Mbagathi Hospital for registration and follow up. If the confirmatory test is positive you will be started on ART and this will be done in the CCC at Mbagathi Hospital.

Risks: A little pain with the prick. I will ask some questions which might be personal but you are under no obligation to answer any questions which you find uncomfortable. HIV testing might cause some anxiety and the finger prick to draw blood may be painful and perhaps you will cry.

Benefits: Knowledge of your HIV status will enable you to get the right treatment and will help health workers taking care of you to give you appropriate care. Your participation in this study will help generate information that will help other children in the future even if you do not directly benefit from this study.

Voluntary participation: If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop. Also,

please be reassured that this will not affect the way that we shall care for you today at the clinic or in the future

I will give you an opportunity to talk with your caregivers before you decide whether or not to participate. I will also ask your parents to give their permission for you to take part in this study. But even if your parents say “yes” you can still decide not to do this.

Feel free to ask any questions that you have about the study. Signing your name at the bottom means that you agree to be in this study.

Name of child..... Signature.....

Name of Caregiver..... Signature.....

Name of researcher/assistant.....Signature.....

Date.....

Appendix 7: Child Assent Form for Interviews (Swahili)

Utangulizi: Grace Soma, mwanafunzi uzamili katika Idara ya Pediatrics na Afya ya Mtoto, Chuo Kikuu cha Nairobi anafanya utafiti juu ya kupima virusi vya ukimwi kwa watoto.

Lengo: Lengo la utafiti huu ni ya kujua nini maoni yako juu ya kupima virusi vya ukimwi kwa watoto na nini sababu ambazo zinaweza kushawishi maamuzi yako. Nataka kukupa fursa ya kuungana nasi kwa utafiti huu. Nitakupatia maelezo kuhusu uchunguzi wangu na ninakualika uwe mmoja wa washirika.

Utaratibu : Ukikubali kushiriki katika utafiti huu, nitamuuliza mchungaji wako maswali machache na majibu yatajazwa katika dodoso. Baada ya maswali, kutakuwa na fursa ya kupima virusi vya ukimwi kwako.

Kama uko tayari na unataka kujua matokeo ya mtihani wa kupimwa virusi vya ukimwi , mimi nitasafisha kidole cha pete cha mkono wa kushoto mara tatu. Nami kisha nitachoma kidole mbali katikati, kama ni inavyofanyika wakati wa kuchukua damu ya mtihani wa kupima vimelea vya malaria. Matokeo itakuwa tayari baada ya dakika 15.

Nitakujulisha matokeo ya mtihani huu. Kama matokeo ya mtihani ni hasi basi utaendelea na utaratibu wa huduma katika kliniki.

Kama matokeo ya mtihani ni chanya, utapata madawa na tutatoa sampuli nyingine kwa kipimo cha ziada kwa ajili ya mtihani wa confirmatory PCR / DNA. Wewe na mchungaji wako mtapelekwa CCC ya Mbagathi Hospital kwa ajili ya usajili na kufuatilia. Kama matokeo ya mtihani wa DNA / PCR ni chanya, basi utapatiwa ART na hii itafanyika katika CCC ya Mbagathi Hospital.

Hatari: Naweza kukuuliza baadhi ya maswali ambayo inaweza kuwa binafsi lakini wewe ni chini ya wajibu wako kutojibu maswali yoyote ambayo unaweza kupata wasiwasi.

Kupima virusi vya ukimwi inaweza kusababisha baadhi ya wasiwasi na chomo kidole kuteka damu inaweza kuwa chungu na kusababisha kulia.

Faida: Kujua hali ya kuathiriwa na virusi vya ukimwi wa mtoto wako itamwezesha kupata matibabu mwafaka. Ushiriki wako katika utafiti huu utasaidia kutoa taarifa ambazo zitasaidia watoto wengine katika siku zijazo hata kama mtoto wako hatafaidika moja kwa moja na utafiti huu.

Usiri: Ujumbe wowote ambao utakusanywa utakuwa wa siri. Daktari wa kliniki hii pekee ndiye atakayeelezewa matokeo ya vipimo vya virusi vya ukimwi kwa manufaa yako kwa suala la tiba na matunzo.

Ushirika wa hiari : Ushiriki wako katika utafiti huu ni hiari kabisa. Unaweza kuondoka kutoka utafiti katika hatua yoyote bila maelezo au madhara yoyote kwa tiba na matunzo kwako. Pia, kumbuka ya kwamba hakuna mtu yeyote atakaye kasirika na wewe kwa kutoshiriki katika utafiti huu.

Nitakupatia fursa ya kuzungumza na wachungaji wako kabla uamue kama unataka kushiriki katika utafiti huu. Nitawauliza wachungaji wako pia watupe ruhusa ili Ushiriki katika utafiti huu lakini ijapokuwa wachungaji wako watasema ndio, uamuzi bado ni wako. Tafadhali jiskie huru kuuliza swali lolote lile. Ukikubali kushiriki katika utafiti huu, utatia sahihi lako hapa chini.

Jina la mtoto..... Sahihi.....

Jina la Mzazi au mchungaji wa mtoto.....Sahihi.....

Tarehe:

Jina la Mchunguzi au Mchunguzi msaidizi.....

Sahihi.....Tarehe.....

Appendix 8: Standard Structured Questionnaire

The acceptability of routinely offered HIV testing among children at Mbagathi Hospital pediatric outpatient clinics.

Study identification number.....Clinic..... Date.....

Instructions: *Please answer all the questions provided by circling the response or filling in the blank spaces.*

SECTION 1: SOCIODEMOGRAPHIC CHARACTERISTICS OF CAREGIVER

1. Sex 1)Female
 2)Male
2. Completed age in years
3. How are you related to the child?
 - 1) Mother
 - 2) Father
 - 3) Step mother
 - 4) Step father
 - 5) Maternal grandmother
 - 6) Maternal grandfather
 - 7) Maternal aunt
 - 8) Maternal uncle
 - 9) Other specify.....
4. Employment status of caregiver
 - 1) Employed
 - 2) Not employed
 - 3) Self-employed
 - 4) Casual laborer
5. Marital status of caregiver
 - 1) Single /never married
 - 2) Married monogamous
 - 3) Married polygamous
 - 4) Couple resides together

- 5) Couple resides apart
- 6) Separated
- 7) Divorced
- 8) Widowed
- 9) Widower
- 6. Number of children.....
- 7. Number of years of caregivers education
- 8. Amount family income in a month.....
- 9. Caregivers religion
 - a. Christian
 - b. Muslim
 - c. Hindu
 - d. Other (specify).....
- 10. How long have you lived with this child?
- 11. Residence: a) urban b) rural
- 12. Number of rooms of residence.....
- 13. Access to tapped water : a) yes b) no
- 14. Access to flush toilet : a)yes b) no
- 15. Access to TV in the house : a) yes b) no
- 16. Access to radio in the house : a) yes b) no

SECTION 2: ANTENATAL HISTORY

- 1. Parity.....
- 2. Attended ANC : a)yes b) no
- 3. ANC number of visits attended.....
- 4. ANC profile documentation/book available : a) yes b) no
- 5. VDRL test done at ANC : a) yes b) no
- 6. HIV test done at ANC : a)yes b)no

SECTION 3: CAREGIVER’S /FAMILY HIV RISK PROFILE

- 1. Previous admission of caregiver to hospital in last 3months : a) yes b) no
- 2. Previous HIV test done on caregiver : a) yes b) no

3. Knowledge of HIV status : a) yes b) no
4. Knowledge of partners HIV status : a) yes b) no
5. Previous TB infection in caregiver : a) yes b) no
6. Nuclear family member with TB : a) yes b) no
7. Nuclear family member with HIV : a) yes b) no
8. Nuclear family member on ART : a) yes b) no
9. HIV related death in family : a) yes b) no
10. With whom would you share your own HIV test result:

- 1) Spouse
- 2) Parent
- 3) Sibling
- 4) Friend
- 5) No one
- 6) Other,
specify.....

SECTION 4: SOCIODEMOGRAPHIC CHARACTERISTICS OF THE CHILD

1. Age in months.....
2. Sex: a) male b) female
3. Biological mother alive : a) yes b) no (year of death.....)
4. Biological father alive : a) yes b) no (year of death.....)
5. Residence:
 - a) Both biological parents
 - b) Biological mother
 - c) Biological father
 - d) Maternal relatives
 - e) Paternal relatives
 - f) Orphanage
 - g) Adoptive parents
6. Number of siblings.....
7. Family order

SECTION 5: CHILD’S MEDICAL INFORMATION

1. Child health care available : a) yes b) no
2. Immunization up-to-date by KEPI :a) yes b) no (if no, explain.....)
3. Previous admission in the last 3 months: a) yes b) no
4. Previous visit to health facility in last 3months : a) yes b) no
5. Previous TB infection in child: a) yes b) no
6. Number of visits to health facility in last 3months :.....
7. Child has current medical illness and is on follow up: a) yes b) no
8. Previous HIV test: a) yes b) no
9. If no, reasons for lack of prior testing:
 - a) Transport costs
 - b) Costs of testing
 - c) Lack of availability of HIV testing services
 - d) No perceived risk of HIV infection
 - e) Fear of knowledge of HIV status
 - f) Stigma
 - g) Child too young to be tested
 - h) Painful to test the child
 - i) Other(specify).....
10. Knowledge of child’s HIV status: a) yes b) no
11. HIV status documented on review of health card/medical records: a) yes b) no
12. Reasons for current visit to health facility:
 - a) Child is unwell
 - b) Follow up for known medical condition
 - c) Routine postnatal check up
 - d) Immunization
 - e) Weight and growth monitoring
 - f) Nutrition follow up
 - g) Other (specify).....

13. Current feeding plan:
- a) Exclusive breastfeeding
 - b) Replacement feeding
 - c) Mixed feeding
 - d) Weaned and on solid foods or Family diet

SECTION 6: FACILITATORS AND BARRIERS TOWARDS TESTING

1. What is the single most important factor that would motivate you to accept HIV testing for your child:
- a) Child's sickness
 - b) Suspicion of HIV infection in caregiver
 - c) Suspicion of HIV infection in child
 - d) Request by health worker
 - e) Availability of HIV treatment and care
 - f) Lack of stigma from family
 - g) Lack of stigma from health workers
 - h) Other,
specify.....
2. What is the single most important factor that would hinder you from accepting HIV testing for your child:
- a) Attitude of health worker
 - b) Lack of privacy
 - c) Lack of confidentiality
 - d) Lack of time
 - e) Others,
specify.....
3. With whom would you share the child's HIV test result:
- a) Spouse
 - b) Own parent
 - c) Own sibling

- d) Parent of child
- e) Child's sibling
- f) Child care provider
- g) Health worker
- h) Religious leader
- i) No one
- j) Other,(specify).....

4. Do you need family members /other individual's permission before the child is tested for HIV: a) yes b) no

(If yes answer question 5 if no proceed to question 6)

5. From which family member/individual will you require permission before the child is tested for HIV:

- a) Own parent
- b) Child's parent
- c) Spouse
- d) Mother in law
- e) Other (specify).....

6. What do you think will be the reaction of family members reaction if the child is tested for HIV without their prior knowledge, permission or consent:

- 1) Angry
- 2) Accepting
- 3) Indifferent
- 4) Don't know
- 5) Other, specify.....

SECTION 7: HIV STATUS ASSESSMENT

- 1. Willing to undergo a HIV test: a) yes b) no
- 2. HIV testing done when offered: a) yes b) no
- 3. Child's HIV antibody test results:
 - a) Determine : a) positive b) negative

- b) First Response : a) positive b) negative
 - c) Unigold : a) positive b) negative
- 4. Caregiver tested: a)yes b) no
- 5. Caregiver test results:
 - a) Determine : a) positive b) negative
 - b) First Response : a) positive b) negative
 - c) Unigold : a) positive b) negative
- 6. PCR/DNA confirmatory test done: a) yes b) no
- 7. PCR confirmatory test results :a) positive b) negative
- 8. HIV status : a) positive b) negative
- 9. Offering of the test during the visit acceptable : a) yes b) no
- 10. Concerns with HIV testing offered:
 - a) Privacy
 - b) Confidentiality
 - c) Other, specify.....
- 11. Reason for not accepting testing when offered:
 - a) Need more time to think
 - b) Afraid of spouse/family members reaction
 - c) Don't think child is infected
 - d) Lack of privacy
 - e) Lack of confidentiality
 - f) Other, specify.....

Appendix 9: Free Listing Recording Form

Age.....Sex.....Unit.....Relationship with child

Purpose of visit: a)routine b) child sick c)clinic follow up

1. Please list for me all the reasons that would motivate you to accept HIV testing for your child:

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

2. Please list for me all the reasons that would hinder you from accepting HIV testing for your child:

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

3. Please list for me all the people with whom you would share the child's HIV test result:

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

4. Please list for me all the concerns that you would like addressed before you accept HIV testing for our child:

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

5. What are your views on obtaining assent for children being tested for HIV? Would this deter you from accepting HIV testing for your child

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Appendix 10: Caregiver Consent form for Case Studies (English)

Introduction: Grace Soma, a postgraduate student at the Department of Pediatrics and Child Health, University of Nairobi is conducting a study on HIV testing in children. This research is part of the requirements for qualification with a Masters of Medicine degree in Pediatrics and Child Health at the University of Nairobi.

When you came to the clinic today you received information on Human Immunodeficiency Virus (HIV) and I have also been able to have a one on one discussion with you on the same. We discussed what HIV is, how it is transmitted and how it affects health leading to opportunistic infections like pneumocystis carinii pneumonia (PCP). We also discussed how HIV is diagnosed and that although there is no cure there is a package of care available to keep HIV infected children healthy. This includes antiretroviral treatment (ART), cotrimoxazole to prevent infections which are common in HIV infected people, a balanced diet, updating immunizations, treatment of opportunistic infections, regular monitoring of growth and development and counseling to help the affected person to deal with HIV associated problems. This package of care is available at the CCC in Mbagathi Hospital

HIV infection among children is common and it is not easy to tell whether a child is infected or not by general examination. The Ministry of health and WHO recommend establishing the HIV exposure status of all children by 6 weeks week of age or at first contact with a health worker irregardless of the purpose of their visit to the health facility. HIV testing is being offered as part of the care package during your visits to health facilities including the clinic. The aim of this study is to find out what your views are concerning this and what factors influence your decisions. I want to offer you the opportunity to be part of this study. I am going to give you information on the study and invite you to be part of the study. Please feel free to ask any questions.

Study title: THE ACCEPTABILITY OF ROUTINELY OFFERED PEDIATRIC HIV TESTING AT MBAGATHI HOSPITAL PEDIATRIC OUTPATIENT CLINICS.

Study Procedures

If you accept to participate in the study, I will ask you some questions. The aim of this discussion will be to explore your perspectives, opinions and perceptions of routinely

offered pediatric HIV testing at this clinic. The information obtained from this study will be used to provide information to the hospital in order to improve your future experiences. This interview will take about forty-five minutes to an hour.

Anonymity: Despite being taped, I would like to assure you that the discussion will be anonymous. The tapes will be kept safely in a locked facility until they are transcribed word for word, then they will be destroyed. The notes taken during this interview will not record individuals' names. Try to answer and comment as accurately and truthfully as possible. If there are any questions or discussions that you do not wish to answer or participate in, you do not have to do so; however please try to answer and be as involved as much as possible.

Risks : I will ask some questions which might be personal but you are under no obligation to answer any questions which you find uncomfortable.

Benefits: Your participation in this study will help generate information that will help other children in the future even if your child does not directly benefit from this study.

Compensation: No incentive or compensation will be given to you for participating in the study.

Cost: You will not incur any extra costs by participating in the study.

Confidentiality: The information that you disclose during the interview will be highly confidential.

Voluntary participation: Your participation in this study is entirely voluntary. You may withdraw from the study at any point without explanation or consequence and the management of your child will in no way be interfered with.

CONSENT FORM

I confirm that I have read and understood the above information about the study. I have had the opportunity to ask questions. I agree to take part in the above study.

Signature of participant.....Date

I.....declare that I have explained to the participant the study purpose and procedure. I have also allowed the participant to ask questions regarding the study.

Signature.....Date.....

Appendix 11: Caregiver Consent form for Case Studies (Swahili)

TARATIBU ZA MAELEZO KWA MSHIRIKA

Utangulizi: Grace Soma, mwanafunzi uzamili katika Idara ya Pediatrics na Afya ya Mtoto, Chuo Kikuu cha Nairobi anafanya utafiti juu ya kupima virusi vya ukimwi kwa watoto. Utafiti huu ni sehemu ya mahitaji ya kufuzu kwa wa tiba shahada katika Pediatrics na Afya ya Mtoto katika Chuo Kikuu cha Nairobi.

Wakati ulikuja kliniki leo ulipokea taarifa juu ya Virusi vya Ukimwi (VVU) na mimi pia nimeweza kuwa na mjadala mmoja kwa mmoja na wewe kuhusu jambo hili. Tulijadili virusi vya ukimwi ni nini, jinsi unavyoambukizwa na jinsi unaathiri afya na kusababisha magonjwa nyemelezi. Pia, tulikuelezea ya kwamba, ingawa hakuna tiba kuna mfuko wa huduma inapatikana ya kuweka watoto walioambukizwa virusi vya ukimwi na afya. Pamoja na tiba ya kupunguza makali (ART), kuna cotrimoxazole ya kuzuia maambukizi ambayo ni ya kawaida kwa walioathiriwa na virus vya ukimwi. Mfuko huu wa huduma inapatikana katika CCC ya Mbagathi Hospital.

Maambukizi ya virusi vya ukimwi miongoni mwa watoto ni jambo la kawaida na si rahisi kujua kama mtoto ameambukizwa au la kwa mitihani ya ujumla. Wizara ya afya na WHO inapendekeza kutambua hali ya kuathiriwa na virusi vya ukimwi kwa watoto wote waliotimiza wiki 6 ya umri au katika kuwasiliana ya kwanza na mfanyakazi wa afya bila kuzingatia sababu ya ziara yao kwa kituo cha afya.

Lengo: Lengo la utafiti huu ni ya kujua nini maoni yako juu ya kupima virusi vya ukimwi kwa watoto na nini sababu ambazo zinaweza kushawishi maamuzi yako. Nataka kukupa fursa ya kuungana nasi kwa utafiti huu. Nitakupatia maelezo kuhusu uchunguzi wangu na ninakualika uwe mmoja wa washirika. Tafadhali jiskie huru kuuliza swali lolote lile.

Utaratibu : Ukikubali kushiriki katika utafiti huu, utaulizwa maswali machache na mjadala wetu utanaswa kwenye kifaa cha kunasa sauti. Lengo la mjadala huu itakuwa ya kuchunguza mitazamo yako na maoni kuhusu mitazamo ya mara kwa mara inayotolewa kupima virusi vya ukimwi kwa watoto katika kliniki kasha huku Mbagathi Hospital. Taarifa zitakazopatikana kutoka kwa utafiti huu zitatumika kutoa taarifa kwa hospitali ili kuboresha uzoefu wako siku zijazo. Mahojiano haya yatachukua dakika arobaini na tano kuelekea saa moja.

Kutotajwa: Licha ya majadiliano yetu kunaswa kwenye kifaa cha kunasa sauti, napenda kukuhakikishia kuwa mjadala wetu utakuwa bila majina. Kanda ya majadiliano yetu yatawekwa kwa usalama katika kituo kimefungwa na wakati wa kuandika majadiliano hayo, majina ya watu binafsi hayatarekodiwa. Jaribu kujibu na kutoa maoni kwa usahihi na ukweli iwezekanavyo. Kama kuna maswali yoyote au mjadala ambayo huna na unataka kujibiwa jiskie huru kuuliza. Hata hivyo tafadhali jaribu kujibu na kujihusisha kwa mjadala iwezekanavyo

Hatari: Naweza kukuuliza baadhi ya maswali ambayo inaweza kuwa binafsi lakini wewe ni chini ya wajibu wako kutojibu maswali yoyote ambayo unaweza kupata wasiwasi.

Faida: Kujua hali ya kuathiriwa na virusi vya ukimwi wa motto wako itamwezesha kupata matibabu mwafaka. Ushiriki wako katika utafiti huu utasaidia kutoa taarifa ambazo zitasaidia watoto wengine katika siku zijazo hata kama mtoto wako hatafaidika moja kwa moja na utafiti huu.

Malipo: Kushiriki katika utafiti huu hakutakuwa na malipo yoyote kwa mshiriki.

Gharama: Hutalipishwa gharama yoyote ya ziada kwa kushiriki katika utafiti.

Usiri: Ujumbe wowote ambao utakusanywa utakuwa wa siri. Daktari wa kliniki ya hii pekee ndiye atakayeelezewa matekeo ya vipimo vya virusi vya ukimwi kwa manufaa ya mtoto katika suala la tiba na matunzo.

Ushirika wa hiari : Ushiriki wako katika utafiti huu ni hiari kabisa. Unaweza kuondoa kutoka utafiti katika hatua yoyote bila maelezo au madhara yoyote kwa tiba na matunzo ya mtoto wako.

TARATIBU YA IDHINI / RUHUSA

Nimesoma na nimeelewa kabisa taarifa kuhusu utafiti huu. Nimekuwa na nafasi ya kuuliza maswali na yamejibiwa kwa ukamilifu. Nimekubali kushiriki katika utafiti huu.

Sahihi ya Mshiriki:Tarehe:

Miminabaini kwamba nimeeleza mshiriki lengo na utaratibu wa utafiti. Na nimempa mshiriki nafasi ya kuuliza maswali yoyote.

Sahihi.....Tarehe.....

Kama kuna swali lolote, jiskie huru kuwasiliana nami.

Appendix 12: Participant Form for Case Studies

Date:.....Time:.....

Venue:..... Clinic.....

Caregiver

- 1. Sex (1) female
(2)male
- 2. Age in years
- 3. How are you related to the child?.....
- 4. Marital status
.....
- 5. Number of children.....
- 6. How long have you lived with this child?.....
- 7. Residence
 - 1) Urban
 - 2) Rural

Child

- 1. Sex (1) female
(2)male
- 2. Age in years
- 3. Birth order
- 4. Siblings; their health
- 5. What is the purpose of today’s visit?
 - 1) Routine
 - 2) Child sick
- 6. Clinical history;
 - a) Birth history
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b) Antenatal history

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c) Past medical history

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d) Family and social history

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7. Physical examination findings

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Appendix 13: Interview Guide for Case Studies

Welcome and thank you for volunteering to take part in this interview. You have been asked to participate in this discussion as your point of view is important to us.

General guidelines

- I will ask you some questions and you should feel free to respond
- There are no right or wrong answers
- You will not be judged on the basis of your opinions
- Do you have any questions? (answers).
- OK, let's begin

Research Question:

What are the perceptions of caregivers and health workers towards routinely offered pediatric HIV testing at Mbagathi Hospital MCH/OPD clinic?

A. Introduction and establishing rapport

1. First let's talk about you and the lovely child you have brought to clinic today:

- How is the child doing today?
- What brings the child to clinic today?
- How are you related to the child?
- Are you involved in the day to day care of this child?

2. Thank you for letting me know about the child, please tell me a bit about yourself?

- Where do you live? Do you have any form of employment?
- Are you married? And do you live with your partner?

It is nice to know more about you, thank you for sharing this information with me. I would like to reassure you once again that what you have just told me and what we shall discuss today shall be kept confidential and anonymous.

B. Please describe to me your experience when your child received a HIV test

1. How was the test done and where?
2. What did the doctor tell you?
3. Describe to me the process.
4. What were your concerns during that time? How did you feel?
5. What was the attitude of the health worker?

- 6. Did you understand why your child needed to be tested?
- 7. What motivated you to accept HIV testing?

C. Had prior testing been done or offered

- 1. How many visits before testing was offered?
- 2. Who asked for testing?
- 3. Testing in ANC?
- 4. Testing or status of spouse/other siblings?
- 5. Testing during immunization?

D. Are there any settings or circumstances under which you think children should or should not be tested for HIV?

- 1. What are your concerns with regards to testing in these circumstances?
- 2. What are your views on HIV testing that is routinely offered in this facility?
Voluntary? Counseling?
- 3. What would you prefer? to be approached for testing or to be allowed to ask for testing?
- 4. How was your interaction with the health worker and the health system during this period?

NONVERBALCOMMUNICATION

.....

Conclusion

Thank you for participating. This has been a very successful discussion. Your opinions are a valuable asset to this study. We hope you have found the discussion interesting. I would like to remind you that any comments featuring in this report will be anonymous

Appendix 14: Health Workers Consent form for Key Informant Interviews

Introduction: Grace Soma, a postgraduate student at the Department of Pediatrics and Child Health, University of Nairobi is conducting a study on HIV testing in children. This research is part of the requirements for qualification with a Masters of Medicine degree in Pediatrics and Child Health at the University of Nairobi.

You are a health worker at this clinic. In your day to day duties you encounter and provide care to children and their caregivers who are either HIV infected or at risk for HIV infection.

HIV infection among children is common and it is not easy to tell whether a child is infected or not by general examination. The Ministry of health and WHO recommend establishing the HIV exposure status of all children by 6 weeks week of age or at first contact with a health worker irregardless of the purpose of their visit to the health facility. The aim of this study is to find out what your views are concerning this and what factors influence your decision to offer HIV testing to children and caregivers attending Mbagathi hospital pediatric outpatient clinics. I want to offer you the opportunity to be part of this study. I am going to give you information on the study and invite you to be part of the study. Please feel free to ask any questions.

Study title: THE ACCEPTABILITY OF ROUTINELY OFFERED PEDIATRIC HIV TESTING AT MBAGATHI HOSPITAL PEDIATRIC OUTPATIENT CLINCS.

Study Procedures: If you accept to participate in the study, I will ask you some questions. The aim of this discussion will be to explore your perspectives, opinions and perceptions of routinely offered pediatric HIV testing at Mbagathi Hospital pediatric outpatient clinics. The information obtained from this study will be used to provide information to the hospital in order to improve your future experiences.

Anonymity: Despite being taped, I would like to assure you that the discussion will be anonymous. The tapes will be kept safely in a locked facility until they are transcribed

word for word, then they will be destroyed. The notes taken during this interview will not record individuals' names. Try to answer and comment as accurately and truthfully as possible. If there are any questions or discussions that you do not wish to answer or participate in, you do not have to do so; however please try to answer and be as involved as much as possible.

Risks: I will ask some questions which might be personal but you are under no obligation to answer any questions which you find uncomfortable.

Benefits: Your participation in this study will help generate information that will help other health workers involved in the care of children and generate valuable knowledge to the body of medicine.

Compensation: No compensation will be given to you for participating in the study.

Cost: You will not incur any extra costs by participating in the study.

Confidentiality

The information that you disclose during the interview will be highly confidential.

Voluntary participation

Your participation in this study is entirely voluntary. You may withdraw from the study at any point without explanation or consequence and the management of your child will in no way be interfered with.

CONSENT FORM

I confirm that I have read and understood the above information about the study. I have had the opportunity to ask questions. I agree to take part in the above study.

Signature of participant.....Date

I.....declare that I have explained to the participant the study purpose and procedure. I have also allowed the participant to ask questions regarding the study.

Signature.....Date.....

Appendix 15: Participant Form for Health Workers' Key Informant Interviews

Date:.....Time:.....Venue:.....Clinic.....

Participant's ID.....

Section 1: General information

1. Gender : 1)Male 2) Female
2. Age.....years
3. Cadre
 - a) Pediatrician
 - b) Pediatrics registrar
 - c) Nursing officer
 - 1) Certificate 2) Diploma 3)BScN 4) MScN 5)Other(specify).....
4. For how many years have you worked in the medical field
5. How long have you worked in the MCH/OPD clinic.....yearsmonths

Section 2: HIV testing and counseling training

1. Have you had any training on HIV testing and counseling?
 - 1) Yes
 - 2) No
2. If yes when
 - 1) Undergraduate/diploma/certificate training
 - 2) Post graduate/ Higher-diploma training
 - 3) Seminar/conference/in service training
 - 4) E-Learning(internet)
 - 5) Other (specify).....

Year when you received the last training.....

Appendix 16: Interview Guide for Health Workers Key Informant Interviews

A. Introduction and establishing rapport

B. What services do you offer for pediatric HIV testing in this clinic?

1. How is this done? Who does it? Who do you test? Caregiver or baby or both?
2. Please describe to me the process? Is this voluntary?
3. What do you tell the caregivers? Who does the counseling? What happens after that?
4. Do you offer routine testing in your unit?
5. What are your views on routinely offered pediatric HIV testing?
6. Do you think pediatric HIV testing should be routine or targeted?
7. What makes you decide to offer or not offer a HIV test to a child and their caregiver coming to this clinic?
8. Are there any settings or circumstances under which you think children should or should not be tested for HIV? please elaborate on either

C. Have you ever recommended a HIV test to a child and their caregiver? Please describe to me that experience.

1. What made you decide to offer a HIV test to that child and their caregiver?
2. What was the reaction from the caregiver?
3. What were your concerns during that period?
4. Do you ever inquire about prior HIV testing among children and their caregivers? How do you verify? Caregiver reaction?
5. What do you think is the prevalence of HIV infection among the children coming to your unit?

D. What are some of the challenges that you face when offering a HIV test to children and their caregivers in this unit?

1. Response from caregivers? Space? Privacy? Counselors? Kits? Materials?
2. What motivates you to offer HIV testing to children in this clinic? Is there any experience that has motivated you?
3. What discourages you from offering HIV testing to children in this clinic? Number of clients? Caregiver refusal? Workload? Availability of Kits?

Is there any experience that has discouraged you?

4. What are some of your concerns with HIV testing of children in your unit? Effect on workload? Cooperation from mothers? cooperation from fellow health workers?
5. IS HIV testing consistently offered routinely to children in your unit? Are there missed opportunities? Survey on missed opportunities....
6. Do you think your unit is a suitable setting to offer HIV testing services?
7. Anything that you think could be done to improve routine HIV testing for children?

NON-VERBAL COMMUNICATION

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Conclusion

Thank you for participating. This has been a very successful discussion. Your opinions are a valuable asset to this study. We hope you have found the discussion interesting. I would like to remind you that any comments featuring in this report will be anonymous

Appendix 17: KII Participant Phone Repository

No	Phone number	Clinic	Able to participate (tick)	
			Yes	NO
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Appendix 18: Quotes Repository

Poor health of child is a motivator for testing

CS2 Caregiver: *'I agreed because my child was sickly all the time but I was not sick but I just decided to be tested, I didn't know that I was sick, no one knew their status so we agreed.'*

CS2 Caregiver: *'... I used to refuse before saying that even if I was to be told to go and get tested I would not agree but that day I said if I refuse and my child is sick...I said let me just accept and I was tested.'*

Routine testing inconsistently done

KII6: *'... in the wards I think they do for everyone .They should do for everyone, so outpatient is targeted but I guess it is mainly because of the work load and lack of enough staff.'*

KII11: *'The TB clinic, yeah, so again I think is the question of our setting because what happens is that the TB patients initially come through the casualty .So if we were to put testing in casualty, and then it will cut out that ...'*

KII8: *'But then before they refer them to us, let them come with details because they only come with the consultation form. So most of the time we don't know what was done.. so we just like compartmentalize your mind and see okay, this is what am supposed to be doing. And you assume everything else was done and it could be it wasn't done.'*

Targeted testing preferred

KII4: *'Mostly the compulsory ones are the ones who are going to the wards, especially the malnourished children, especially the ones who look clinically unstable; we prefer doing the test to see if there is an underlying cause of HIV causing their condition to deteriorate or something.'*

KII5: '.... maybe the child has signs of you just look at this child and you see no this child should be should be... the HIV test should be done. Yeah so maybe if the child is not responding to treatment, you treat and you are not seeing any improvement now you have to go deeper.'

KIII10: 'According to us here... eh, okay, it depends with the clinician. Some clinicians prefer to test the ones that maybe they think the child might be suffering from HIV. But routinely, we should be testing all of them so some clinicians request all of them to be tested although others prefer some specific children to be tested.'

KIII12: 'So a hundred babies per day one counselor cannot be able to test all of them, so what you do you test the ones that you think the clinician feels that they are legible for testing. Because if you say you test all of them they can't get finished.'

KIII12: 'you are seeing like two hundred or one hundred per day, it is only one person testing, ideally you can't test one hundred people per day. So you can't go for routine, it's not practical. It is more practical if you target. Of course there are options of losing some of the clients. But it might work better than routine'

Low yield for routine testing

KIII10: 'The ones that we normally suspect to be positive actually end up being positive but the ones for routine most of them turn out to be negative.....but the ones that we suspect almost 90% of them turn out to be positive.'

Staffing shortages

KII6: 'We could get more people to do the test because it is just one person doing the test now. If we are seeing 150 in a day it means she has to see those 150, I think that is unfair.'

KII7: 'You see like for the counselors mostly our duties are supposed to be offered during the day. If at all it has to be done during the night there has to be a special arrangement because especially allowance that will compensate that.'

KIII1: ' I think the issue of the staff, I think the challenges might be, you know these are partner supported endeavor... So there is so much they can do. Maybe they are limited in funding, they are not able to employ too many. But I think on the other side, they would also like the hospital maybe to employ its own staff ...so they can't kind of take over all the services that the hospital is offering.'

Task Shifting

KIII2: 'This clinician has like how many patients to see? Do they have time? it is only easy when it is a negative person, but also sometimes you miss out on a negative person can turn out to be positive because maybe some issues were not handled.'

Lack of space

KIII2: Because if they are coming like five hundred per day, there is one counselor testing, there is only one room, because maybe we could have more counselors but rooms are not there so you can't do it

Increased workload affects testing

KIII10: 'Because the work load here is too much. Most of the time you will find one or two clinicians on duty and the number of patients waiting to be attended are so many. In an average day we see like a hundred patients and you can imagine if you are alone the work load becomes a challenge.'

KIII2: 'Yeah, routine testing on workload is obvious because you can imagine if you are seeing 100 pediatrics and then you decide you do a routine, and you have one counselor, one room, even if you had two, it means you can work in shifts, but this counselor also cannot see that number. So even if you combine two counselors working they will see

maximum of 30, if they were two working in one room. But still that is a high number because meaning 15 for half day, 15 for another half day.'

Counseling

KII7: 'The only difficult place is when you've tested a child or a mother then she turns out positive. That's the most challenging part of it but finally we just overcome.'

KII12: 'But my observation shows that if you don't do proper counseling because it is not just a matter of telling somebody "you are HIV positive" because HIV positive status is not something that is going to run away. So it is not about the numbers, you can have numbers but how are you going to sustain them?'

Caregiver refusal

KII10: Some of them, we don't know, eh, others tell you "When I was pregnant I was tested so I don't see a reason of being tested again", others also point out time constraint that "I don't have time to wait", so they just decide to go away.'

KII4: 'Okay most of them don't take the test lightly; they don't want the test to be done on their children, they just think that they are okay so they don't want their children to be tested, so it is not easy to convince the parents to take the children to be tested.'

Sensitization of Health Workers

KII10: 'And also clinicians can also be sensitized or reminded of the importance of testing.'

KII11: 'Yeah but overall we just need sensitization, to keep encouraging the staffs to remember, request and do.'