UNIVERSITY OF NAIROBI

ACCEPTABILITY OF ROUTINELY OFFERED HIV TESTING AMONG CHILDREN ADMITTED AT LUBANGO PROVINCIAL PEDIATRIC HOSPITAL-ANGOLA

BY

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DECLARATION

This dissertation is submitted as my original work and has not been presented for a degree elsewhere.

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DEDICATION

This dissertation is dedicated to my wife Natalia Francisco, my son Hailton Kelly and daughter Kellya Silvia, members of my family for their love, understanding and support during the study process. Without their love, exemplary attitude towards life and intellectual spirit I would not have been able to maintain the level of enthusiasm and motivation. I am greatly indebted to them due to their insightful comments, continuous support, patience, motivation, enthusiasm. My heartiest thanks to my wife who was a solid pillar of support.

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LIST OF ABBREVIATIONS

AIDS Acquired Immunodeficiency Syndrome

ART Anti-Retroviral Drugs

ARV Antiretroviral

CCC Comprehensive Care Clinic

CDC Centre for Disease Control and Prevention

DBS Dried Blood Spot

DNA Deoxy Ribonucleic Acid

DR Democratic Republic

EIA Enzyme Immuno Assay

ELISA Ezyme-linked immunosorbent assay

HIV Human Immunodeficiency Virus

ICU Intensive Care Unit

MOH Ministry of Health

NAT Nucleic acid testing

PGL Persistent Generalized Lymphadenopathy

PHC Primary Health Care

PMTCT Prevention of Mother to Child Transmission

PCR Polymerase Chain Reaction

RIBA Recombinant Immunoblot Assay

SSA Sub-Saharan Africa

UNAIDS Joint United Nations Programme on HIV/AIDS

WHO World Health Organization

IQR Interquartile Range

US United State

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Abstract

Globally, more than 270,000 children under 15 years died of Acquired Immune Deficiency Syndrome (AIDS) in 2009. The antenatal HIV prevalence in Angola is 2.8% and in Lubango it is 2.2%. With the recent availability of Antiretroviral Therapy (ART), routine HIV testing is now an essential component of HIV prevention and care. However many HIV infected children are never identified or are lost from the health care system before they can be enrolled into care contributing to high mortality. It is therefore essential for health care workers in health facilities to recognize routine HIV testing and counseling strategies for admitted children.

Objectives: This study aims to determine the acceptability of routinely offered HIV testing among children admitted at Lubango Provincial Pediatric Hospital in Angola. In addition determine the factors associated with acceptability of HIV testing.

Design:

Cross sectional study design.

Methods:

The children admitted in the wards underwent a physical examination, test for HIV antibody and HIV DNA-PCR; those who tested positive were classified using the World Health Organization (WHO) criteria from November 2013 to January 2014.

Result:

A total of 370 participants (caregiver- child pairs) were recruited into the study and their data analyzed.

Majority 81.3% of the caregivers were single with a mean age of 27 years.

Majority (88.1%) of the participants resided in the urban areas close to the hospital.

A significant number (86.7%) of the caregiver had some form of education with the majority having primary education.

Most (96.2%) caregivers were the biological mothers of the children.

The age distribution of the children was from one to 169 months with a median age of 13 months and an IQR of 8 to 22 months.

Acceptance rate of HIV testing was high, 341/370 (92%: 95%CI 89-94) of the caregivers accepted the children to be tested while 14 refused and 15 were undecided on HIV testing.

Fourteen children tested positive on rapid tests, of these 7 children under the age of 18 months. The children under the age of 18 months had their status additionally checked using a DNA- PCR. Out of these, four children tested positive.

Of those who were positive, majority of children 6 (54%) had stage two HIV disease and one had stage four disease.

After successful iterations at the multivariable modeling, the significant predictor for acceptability for HIV testing was education level and residence.

Education level was associated with acceptability for HIV testing. Caregivers with some level of education had 3 times higher odds of accepting the test compared to those with no education (3.34; 95% CI 1.02- 10.92, p= 0.05) after adjusting for all factors in multivariable model.

Urban dwellers were more likely to accept HIV testing OR = 4.4 (95% CI 1.41, 13.9) p= 0.02.

Parents of female children were less likely to accept HIV testing as compared to parents of boys children, 181 (98.3%) of 184 boys were tested compared to 160 (93.5%) of 171 girls.

Conclusion

The acceptability of routinely offered HIV testing (opt out) of children admitted at Lubango Pediatric Hospital was high (92%).

The predictors of accepting a HIV test are maternal level of education and Residence.

Recommendation.

HIV testing should be offered routinely to children admitted to Lubango Pediatric Hospital.

CHAPTER 1

Introduction

Globally, children account for 18% of HIV-related deaths and 15% of HIV infections each year[1,2], an estimated 2.3 million children are infected and 730,000 need ART which 275,000 receive[3]. The mortality of untreated pediatric patients is very high in the first 2 years of life and reaches 75% by age of 5 years. There has been an increase in the number of children who are on treatment but they still represent a small proportion of those who need it. The global goal is to provide ART to 80% of the children needing treatment[4]. The achievement of this goal is hampered by new infections among babies of women who did not have access to Prevention of Mother-to-Child Transmission (PMTCT) services, limited access to infant HIV diagnosis services and insufficient numbers of pediatric HIV treatment sites. Eventually, many infected children are never identified or are lost from the system before they can be enrolled into care. The adult HIV testing services do not cater for children. A voluntary testing and counseling centre assumes one has competence to consent and that the individual will then act on the test results and seek care.

Previous HIV testing guidelines did not identify children as a specific target group for HIV testing[5]. Current WHO guidance on provider-initiated HIV testing provides direction on how to overcome barriers to testing children but offers little on how to operationalize pediatric testing[5].The need for feasibility studies on pediatric HIV testing has been identified as a key step to accessing infant and young children early ART initiation.

Uptake of HIV testing among children is low even in high HIV prevalence areas[6].In Angola data on uptake of HIV testing among children is limited. Angola with a National HIV epidemic of 2.8% is not classified among countries with a generalized HIV epidemic and as result there has been less of a focus on developing population based strategies. Although infant diagnosis is offered through PMTCT, the majorities of HIV-infected infants are born to untested mothers and never receives PMTCT prophylaxis. The infants are very unlikely to be identified and get on to treatment without targeted HIV testing strategies.

In support for testing, referral networks and community mobilization to reduce mortality of HIV in children, the Centers for Disease Control and Prevention (CDC) has recommended routine HIV testing at the health facilities[7], but success depends on functioning health facilities. Routine HIV testing and diagnosis for children does not exist in Angola and therefore this study will contribute in identifying the challenges and opportunities that may already be in existence.

Background and literature review

In 2003 an estimated 5million people acquired the HIV infection bringing to 40 million the number of people living with the virus globally and 26.6 millionaires in SSA[7]. Globally, there was an estimated 370,000 new pediatric HIV infections 91% of which were in SSA. In developing countries it is estimated that Maternal to Child Transmission (MTCT) accounts for 1,000 children infection per day. HIV/AIDS in SSA results in substantial child mortality and increases the number of sick children presenting to health facilities. Conditions like malnutrition, tuberculosis, acute respiratory tract infection and diarrhea are more common in HIV infected children than in non HIV infected children.

With the growing awareness of HIV/AIDS and the recent availability of ART, the scope of and reasons for HIV testing have broadened as an essential component of HIV prevention and care[7]. The intensity of the HIV epidemic varies among Angola's different provinces, with the highest rate at 4.4% of infection occurring in the areas bordering Namibia and along the border of Democratic Republic of the Congo. According to WHO/UNAIDS/UNICEF 35% of the PLWHIV were receiving ART at the end of 2009, nearly 42,000 individuals including TB patients received testing and counseling services as well as test results[7].Behavior change communication in HIV prevention activities reached more than100, 000 individuals in 2009.

The social conceptualization and representation of HIV testing influences HIV test up take risks due to discrimination, lack of awareness or knowledge and fear that deter people from HIV testing[8].

UNAIDS, identified various approaches to HIV testing such as integration of HIV testing into Primary HealthCare (PHC) services and into hospital settings.

The WHO is promoting the pre-test initiative, which calls for HIV testing and counseling as an entry point for access to care and prevention[9].

Although globally, routine HIV testing is an important strategy in managing HIV transmission it has not been prioritized in pediatric HIV care and prevention in Angola. HIV testing opens opportunities for the infected individual to access psychological support and care and reduce HIV transmission. This will facilitate the introduction of ART to reduce HIV transmission, prolong life and reduce mortality in HIV positive children. In order for these interventions to achieve the desired goals, the magnitude of unacceptability of HIV testing needs to be explored in Angola.

The difficulties in diagnosing infant and children with HIV infection have been cited as barriers to increasing the number of children receiving ART globally. Presently, appropriate care (including ART, co-trimoxazole prophylaxis, support care) for HIV infected children exist at Lubango Provincial Pediatric Hospital and most of the provincial and county hospitals in Angola. However without a diagnosis, an HIV infected child cannot access the effective HIV care. The routine HIV testing will facilitate early access into care for children who were not known and will offer re-entry point back into care when lost.

Approach to Pediatric HIV Testing

Globally, the difficulties of HIV diagnosis are a barrier towards children receiving antiretroviral therapy (ART)[9]. The routine HIV testing of children may be an appropriate approach to identify children missed during PMTCT interventions to ensure cost effectiveness. Challenges to HIV testing among infants below 18 months, include lack of Polymerase Chain Reaction (PCR) testing, cost of assays and repeat PCRs for infants exposed to infected breast milk[10]. In 2007, WHO estimated that only 8% of infants known to be HIV-exposed were tested for HIV within the first 2 months of life[11]? The waiting for infants to develop symptoms or become old to test using standard rapid tests is not ideal but is the norm in Angola and results in late testing in the course of infection when ART may be less effective.

The parental attitudes towards HIV testing are important for success though many parents are apprehensive when unsure of their own HIV status[12, 13, 14.]The parents/guardians' fear of discrimination and fear of their children's' HIV positive

status. Those who expressed fear that children tested for HIV would be discriminated against were less likely to have positive attitudes to testing for HIV. Fear of discrimination has negatively affected uptake to HIV testing and care among children. Equally important is the issue of what informed consent means for pediatric patients and their caregiver. There are challenges in HIV testing for children who do not understand more about it and HIV positive results can indicate the status of the mother.

The decision to conduct an HIV test on a child is linked to parents' status and perceived risk[15]. In Harare, Zimbabwe a study showed that biological parents feared the HIV test among their children could disclose their own status, while guardians never shared these concerns[15]. The use of existing health facilities is needed to incorporate pediatric HIV testing entry points for diagnosis of HIV infected children and link them to care. In such settings, an initial rapid test could be used as a screen to test mothers or their newborns, with a subsequent PCR for infants who test positive or whose mothers are positive.

HIV testing approach

Opt-out versus opt-in

Opt-out testing is the norm in countries with a generalized AIDS epidemic. Patient is informed that HIV testing is part of the care package but they have a right to opt out of testing. In opt-out HIV screening, the HIV tests done routinely unless a client refuses to take an HIV test. Generally clients have the right to refuse an HIV test. This goes along in helping the clients find out if they have HIV, help those infected with HIV earlier, when treatment works best and reduce stigma associated with HIV testing.

In India, private hospitals conducted mandatory testing and documented that many Indian patients were tested without consent.[16]In Holland, opt-out testing was implemented, the possibility of allowing health workers to disclose patients' status to their partners. In Africa it has been beneficial. In Botswana since 2004, prenatal care programs began to implement opt-out testing and counseling and this resulted in higher rates of testing .[17]The routine offer of testing at health facilities and testing for individuals and results given Burkina Faso increased the rate of HIV testing despite very limited treatment. Shared confidentiality is another important concept. Care is

provided by a multiplicity of health workers and they need to know status in order to optimize care. In Kenya and many other countries in sub Sahara Africa the mother-baby card carries that information. It frees the mother from having to explain herself every time she meets a new care provider.

Perception of HIV risks

The main reason people do not take HIV tests or return for the result is fear. This is not surprising, since HIV is life threatening. But fear is also about the social consequences of the illness and rejection by loved ones and discrimination[18].

There is pattern of discrepancy between intent to be tested and actual behavior due to worries about consequences, individuals often do not execute their plan to take HIV tests. In African countries, 2/3 of respondents would like to get tested, but the proportion of those who reported being tested was 15% in some settings[19]. The significance of HIV tests goes well beyond the information about sero status that they provide; their results have a powerful impact on patients' lives, often leading to a complete redefinition of a person's social relationship hence the need to consider appeals to the "right to know" one's HIV status as implemented in some programs[20]. Although this approach may work in some settings, the effectiveness of casting HIV tests in a rights discourse needs to be assessed against evidence about how it resonates with local views.

Difficulties of HIV testing and disclosure

The levels of disclosure and partner involvement after tests are variable and generally low. In Tanzania, only 22% of women revealed their statuses to their partners who were not clear about their status[21]. In Burkina Faso, only 18% of women made disclosure to their partners[22], in ex Zaire (DRC), only 2% of women brought their partners for testing[22, 23]. There are also fears that speaking about the disease may accelerate its course and silence seems a safer option[24].

A study in Tanzania showed that 50% of women experienced positive responses while in Kenya and Zambia most HIV-positive women reported positive outcomes but in developing countries violence was reported in 3% - 15%[25].

Stigma on HIV testing

Stigma against HIV is reported to be pervasive and to be the main reason for the reluctance to be tested, to disclose HIV status, or to take ARVs[26]. This has been documented in South Africa, Indonesia, Tanzania, Botswana, Ethiopia, Ghana, India, Uganda, Thailand and Zimbabwe, even in health care settings, health workers may stigmatize patients[27].

Although stigma and discrimination against people living with HIV/AIDS have been amply documented and although fear of stigma is consistently reported to be a deterrent of testing, few studies provide quantifiable measures of the effect of stigma on HIV testing. It is difficult to disentangle the effect of stigma to HIV status, as compared with other characteristics[28]. If stigma and discrimination specific to HIV impede testing, then evidence is needed on those factors that are amenable to change and that would encourage testing.

Moving Forward

Despite the critical importance of HIV testing, acceptance of pediatric testing among caregivers and children in SSA has not yet been well studied[28]. However routine HIV testing of children have been attempted in SSA. What is required is a coordinated effort at the health facilities such as Lubango pediatric hospital to ensure HIV infected children and those missed by PMTCT are identified and linked to care. Its challenging when one weighs the parents' right to confidentiality against the child's right to care meaning that a standardized approach to HIV testing is feasible. Most parents/guardians have an unfounded anxiety about the status of their children. People who have been tested for HIV and those who are HIV-negative will be cub the fear to test children for HIV.

In the US many states perform mandatory testing of newborns, allowing the clinician to offer postnatal ARV prophylaxis to the index case, comprehensive HIV care to the mother, early treatment to the child. The result was reduction of pediatric HIV mortality and MTCT. Majority of people see the benefits of HIV testing and would feel happier if their children are tested for HIV.

Approximately 4/5 of people who look after children know where to access HIV testing for their children and suggest a conducive environment for increasing uptake of pediatric testing. The routine HIV testing among hospitalized children is being advocated for given that HIV contributes to high hospitalization in high HIV prevalence countries[27].The high acceptance of pediatric testing was documented among health care workers from Cote d'Ivoire[25].

In contrast, almost 1/2 of caregivers from Western Kenya refused to have their high-risk children tested for HIV[28], but in Angola there is no data for situation comparison. This is the first study to present institutional level data on acceptability of inward pediatric HIV testing from Angola. Pediatric HIV testing is the essential gateway to prevention and care services for HIV/AIDS in children. The routine HIV testing strategy will decrease the pediatric treatment gap in Angola and should be based on the local epidemiology of the epidemic to identify the large numbers of HIV-seropositive children at Lubango pediatric hospital.

CHAPTER 2

Justification

HIV testing offers significant benefits to those infected families and the public at large. With the recent availability of Anti Retroviral Drugs (ARVS) the immunological destruction from HIV can be reversed, prolong and improve the quality of life. Even with limited availability of ART, early diagnosis of HIV and access to basic preventive care including cotrimoxazole can slow progression to AIDS. The HIV counseling and testing among children is the cornerstone for Angola's pediatric HIV program growth and has a role to play for successful response to the HIV epidemic.

The acceptability of HIV testing is a key component of HIV prevention, care and support, as uninfected individuals can take steps to avoid becoming infected, while infected individuals can avoid transmission and this contribute to medication adherence. Referral to care and support services can also be initiated quite early enough. The provision of HIV testing to caretakers and family members of HIV-positive children can facilitate the identification of other HIV-infected individuals and partner disclosure, seeking of care, support groups and medical interventions.

Angola lacks adequate information about the trends in the acceptability of HIV testing in the hospitals and children have remained on the periphery of the Angola's HIV/ AIDs affairs. The children are only tested for HIV when they develop HIV signs and symptoms or complications. This means that many asymptomatic children who are HIV exposed, or infected miss the relevant interventions. With no data on acceptability of routine pediatric HIV testing, Angolan children have been excluded from the formulation and designing of HIV policies in term of offering test due to the limited research in the country

HIV counseling and testing is the first step in referral to care and support services, also facilitates increase in access to HIV/AIDS care including ART. The routine HIV testing among children will increase the number of children tested and initiated into care and translate into fewer admissions for ill children saving a lot of resources for the family, health facilities and the nation at large. The high acceptability of HIV testing can strengthen health care delivery among HIV infected children in Angola. The findings from this study will go a long way in formulation of recommendation for

interventions and strategies in Angola's health sector. This will be very instrumental in the planning and allocation of appropriate resources in the health care delivery.

Problem statement

A study in Angola revealed stigma and discrimination among the HIV positive individuals and non educated populations who affirmed that they would not share or buy food from and HIV positive shopkeeper. Discriminatory tendencies towards HIV positive individuals were reported among 80% of the youth in Angola[8].

The country's national strategic plan does not address the routine HIV testing among the admitted children. The country's national poverty strategy prioritizes HIV/AIDS prevention and control as a means to reduce poverty. With Angola's budgetary line item for HIV programming in the health sector operational plan, the Angola government is committed, but routine testing among children remains unaddressed.

Overall objective:

To determine the acceptability of routinely offered HIV testing among children admitted at Lubango Provincial Pediatric Hospital

Specific objective

1. To determine the proportion of children whose parents/caregivers accept routinely offered opt-out HIV counseling and testing
2. To determine factors associated with acceptability of routinely offered opt-out HIV testing among children admitted at Lubango Provincial Pediatric Hospital.

CHAPTER 3: METHODOLOGY

Study Design

A cross sectional descriptive study.

Study site

Republic of Angola, a country in Southern Africa bordered by Namibia on the south, the Democratic Republic of (D.R).Congo on the Northern East and Zambia on the East, the Western part is on the Atlantic Ocean and Luanda is the capital city. The exclave province of Cabinda borders the Republic of Congo and the D.R. Congo.

Administrative Division : Bengo, Benguela, Bié, Cabinda, Kuando- Kubango, Kwanza- norte, Kwanza- sul, Cunene, Huambo, Huila, Luanda, Lunda -norte, Lunda -sul, Malange, Moxico, Namibe, Uíge and Zaire.

Figure 1:The map and administrative division of Angola

Study site →

Figure 2: Lubango Pediatric Hospital – Huila Angola

HIV situation in Angola

The estimated HIV prevalence is between 2% - 4,4% with 11,000 estimated deaths in the year 2009.The estimated number of orphans due to HIV is 140,000.The number of people reported to be taking ART are 20,604 with an estimated 86,000 people in need of ART (CDC report of the global AIDS epidemic, 2010).

Huila

Huila is a province in Angola, with an area of 75,002 km^2 and the population is 800,000 in the 14 counties.

Lubango: Capital city of the Angolan province of HUILA located 655,7 km to the south of Luanda (Angolan capital city) with a population of 100,757.

Lubango Pediatric Hospital

Located in LUBANGO/ Area HELDER NETO (the core of the city) and occupies an area of 998 meter square and has a capacity150 beds. The hospital admits about 6783 children annually from which approximately 169 are tested for HIV (TARGETED TEST) and between 13 % - 18% turn positive.

Study Period
November 2013 to January 2014

Study population

All Children admitted at Lubango Provincial Pediatrics wards who met the inclusion criteria.

Inclusion criteria

- Children aged 0-14 years
- Children of unknown HIV status
- Care takers who give an informed consent

Exclusion criteria

- Children aged over 14 years
- Care takers who decline to give an informed consent
- Known HIV positive children
- Abandoned children
- Patients admitted in the Intensive Care Unit(ICU) at Lubango Provincial Pediatrics wards

Sample size determination

The Fishers formula was used to determine the minimum sample size as shown:

$n= [Z\alpha/2\ p(1-p)/d^2]=384$

Where, n is the required minimum sample size,

$Z\alpha/2$ is a standard score corresponding to 95% CI thus equal to 1.96,

p = 50%Prevalence of acceptability of HIV testing among children since no study has been done.

d is the margin of error and was taken to be 5% (0.05).

$\frac{1.96x1.96x1-0.5x0.5}{0.05x0.05}$ =384

Since the population is $\leq$ 10,000 finite population correction factor will be used with an assumed study population of 7,262.The actual sample size will be

$nf= \frac{n}{1+n/N)}$

384/1+ (384/7262) =365

The minimum sample size is 365

Sampling method

The study subjects were selected on a consecutive sampling basis. The recruited subjects were assessed clinically and questionnaires were administered to patient caretakers until a sample size of 370 subjects was attained. Three trained research assistants were recruited from the pediatric wards and trained to collect data. The emergency care of the children was not interrupted by the interview or other matters relating to the study as the interview was conducted one day post admission.

Recruitment and consent

The study was explained to the caretaker of the admitted child and a written consent obtained for recruitment into the study. The caretaker was advised that the test is important but not mandatory and that declining to participate in the study was not going to affect the quality of care given to the child. While administering the data collection tool, obtaining study records were handled with a high level of confidentiality and privacy. The information about HIV transmission, diagnosis and availability of treatment was given to all the caretakers on admission at the pediatric ward. During the interview privacy and confidentiality was observed. After the interview health education/information, pre testing and post test counseling was done.

HIV Testing and laboratory methods

The principal investigator and research assistants conducted the study from Monday to Friday from 9am to 3pm during the study period. Information about HIV transmission, diagnosis and availability of treatment was given to all caretakers during the morning of ward orientation for caretakers that are routinely carried out at the Lubango paediatric wards. The study plan was explained to the caretaker of the admitted child and a written consent to participate in the study was sought. **(Appendix 1I1)**.The child's caretaker was interviewed in a private room of the hospital that was assigned for this purpose. Data was entered into a predesigned standard structured questionnaire **(Appendix 1V)** which included information on the socio economic demographic characteristics and factors associated with routine HIV testing. After the interview a rapid HIV testing was offered as a part of routine patient care with the possibility to opt out of testing, clearly explained to the guardian/parent of the child. The HIV positive children underwent a physical examination to establish their clinical and nutritional status and the presence of opportunistic infections. The child was then staged according to WHO paediatric clinical staging system shown in

(Appendix 1). Caregivers who gave consent to HIV testing had their children HIV tested and the results revealed to them. The post test counselling was then offered.

For a child aged at least six weeks old with an HIV positive result the ward doctor was informed about the child and he/she was put on cotrimoxazole. If the child met the Ministry of Health (MOH) criteria for ART initiation **(Appendix 1)**, medical and psychosocial pre ART preparations was started. The child was immediately linked with the CCC of Lubango paediatric hospital for registration. The children not found to be in immediate need for ARV treatment were upon discharge referred to the Comprehensive Care Clinic (CCC) at Lubango hospital for registration and follow up. If the caretaker of a child with an HIV positive result is the child's parent, he/she was encouraged on HIV testing at the Adult CCC. A child with a negative test result continued with the routine ward care and follow up.

HIV testing and test kit information

HIV testing was carried out in series, using determine HIV1/2 test kit for screening and Unigold HIV test kit for confirmation. Both of the tests were visually read qualitative immune assays for the detection of antibodies to HIV-1 and HIV-2 in human serum, plasma or whole blood and both were approved by the national laboratory committee of the Ministry of health in for use in Angola. The Determine HIV-1/2 test kit is manufactured for Abbot laboratories by the ABBOT JAPAN CO;LTD with a sensitivity of 100% and a specificity of 99.75%.The Unigold HIV test kit is manufactured by TRINITY BIOTECH PLC, of Ireland with a sensitivity of 100% and a specificity of 99.7%. A test result was considered positive when both tests were found to be positive and a test result was considered negative when a screening test found a negative result. A result was considered discordant if the screening test result was found positive while the other was negative. A test with a discordant result was repeated in the immunology laboratory of Lubango central hospital which uses ELISA based vironstika HIV Uni-form 11 Ag/Ab test with a sensitivity of 100% and a specificity of 99.9%.The ELISA test is manufactured by biomerieux by, Boseind, The Netherlands.

For children less than 18month with a positive HIV antibody test, a DBS was taken and HIV DNA-PCR test conducted in the University of Nairobi, laboratory of virology

HIV testing Methodology

i. Rapid testing

The fingertip of the left ring finger was cleaned 3 times using 3 different spirit swabs and allowed to air dry. Using a sterile lancet, the skin of the cleaned finger was punctured off at the centre on the fingertip and the first blood drop was wiped away using a sterile gauze pad. The used lancet was discarded into a bio hazard sharps container. The finger was held below elbow level and intermittent pressure applied to the pulp of the punctured finger. Using a micropipette, 70 micro litres of blood was drawn and applied to the sample pads of the test kits and after 15 minutes the test was read. A discordant test was explained to the care taker for them to understand the meaning and the need to confirm the test result and how the confirmation was done.

ii. Elisa Method

An area of the skin was prepared for venepuncture using 3 different cotton swab soaked in 70% alcohol. Then 2mls of whole venous blood was drawn using sterile needle gauge 21 and 2mls syringe. The blood sample was put into a red topped vacutainer and it was taken for HIV testing in the immunology laboratory of central provincial hospital.

Ethical considerations

Approval from the Kenyatta National Hospital/University of Nairobi Ethical Committee was sought and obtained before study procedures commenced. Permission was also sought and obtained from the relevant hospital administration at Lubango Provincial hospital. Written consent was obtained from the caretakers willing to participate in the study.

All the relevant HIV information was given to the caretakers.

- The children with a positive HIV result were staged as per WHO guidelines and started on co trimoxazole prophylaxis according to WHO guidelines. Those in need of ART were started on Pre ART preparations and linked to CCC in Lubango paediatric hospital. Children who were not in need of ART upon discharge were referred to the CCC for continued care support, treatment and follow up.

- Post-test counselling was given to all caretakers who accepted the routinely offered HIV test for their children.

The caretakers were assured of privacy and confidentiality and were reassured that declining to participate in the study was not going to affect the patients care in the ward.

Post-test counselling

This involved supporting the caretaker in adjusting to the test results discussing with him/her the care that is necessary and available for the child, for example co triomxazole prophylaxis and follow up at the CCC (further counselling treatment of opportunistic infections as they occur and ART initiation) The issue of nutrition , positive living, disclosure and ways to avoid infection to children(like avoiding sharing of needles and use of common instruments during rituals of scarification and circumcision was addressed) .

Psychosocial criteria for ART initiation

The criteria used

- An identifiable parent or guardian who understood the regimen and consistently administer the child's medication
- Ability to regularly attend the HIV clinic appointments
- Sustainable long term access to ART

Medical preparation for ART initiation

Medical preparation included conducting a baseline CD4 count and baseline tests to check haematological liver and kidney function tests. During this preparation a clinical assessment (including weight, height and surfaces area) was done. Co triomxazole prophylaxis was initiated, any inter current illnesses was investigated and treated. For older children (>10 years of age) disclosure of the HIV results was addressed.

Counselling preparation for ART initiation

The counselling preparation for ART initiation was done with the aim of helping the care taker to understand the goals of ART, the lifelong nature of therapy, the importance of adherence to ART, the clinic appointments, when and how to

administer drugs and the possibility of immune reconstitution inflammatory syndrome (possibility of a patient initially getting worse before getting better)

Outcome measures

- The proportion of caretakers who accepted their children to be tested for HIV when test is routinely offered
- The characteristics of the caretakers and children in relation to the acceptance of HIV testing.

Data management and statistical analysis plans.

Data entry template was created using SPSS for data entry version 3.0 . Data was checked for completeness and corrected at source. Data entry was done in duplicate for validation (double entry) and cross-checked for entry error and range checks. The data was cleaned and validated before analysis. The characteristics of the caretakers and children was described using means and medians for continuous variables Data Analysis was done using SPSS version 20. To ensure confidentiality all personal identifiers were left out of the data set.

Variables

The dependent variable was acceptance of HIV testing , where there were those who accepted HIV testing , those who refused and those who were undecided.

Continuous variables that had normal distribution (care takers age, number of children) were categorized based on the mean into two categories while skewed variables (child age) were categorized based on the median.

Descriptive analysis

Descriptive results were reported and missing data quantified. Proportions are reported for categorical data while mean and standard deviation are reported for a normally distributed data while median and inter-quartile range have been reported for skewed data.

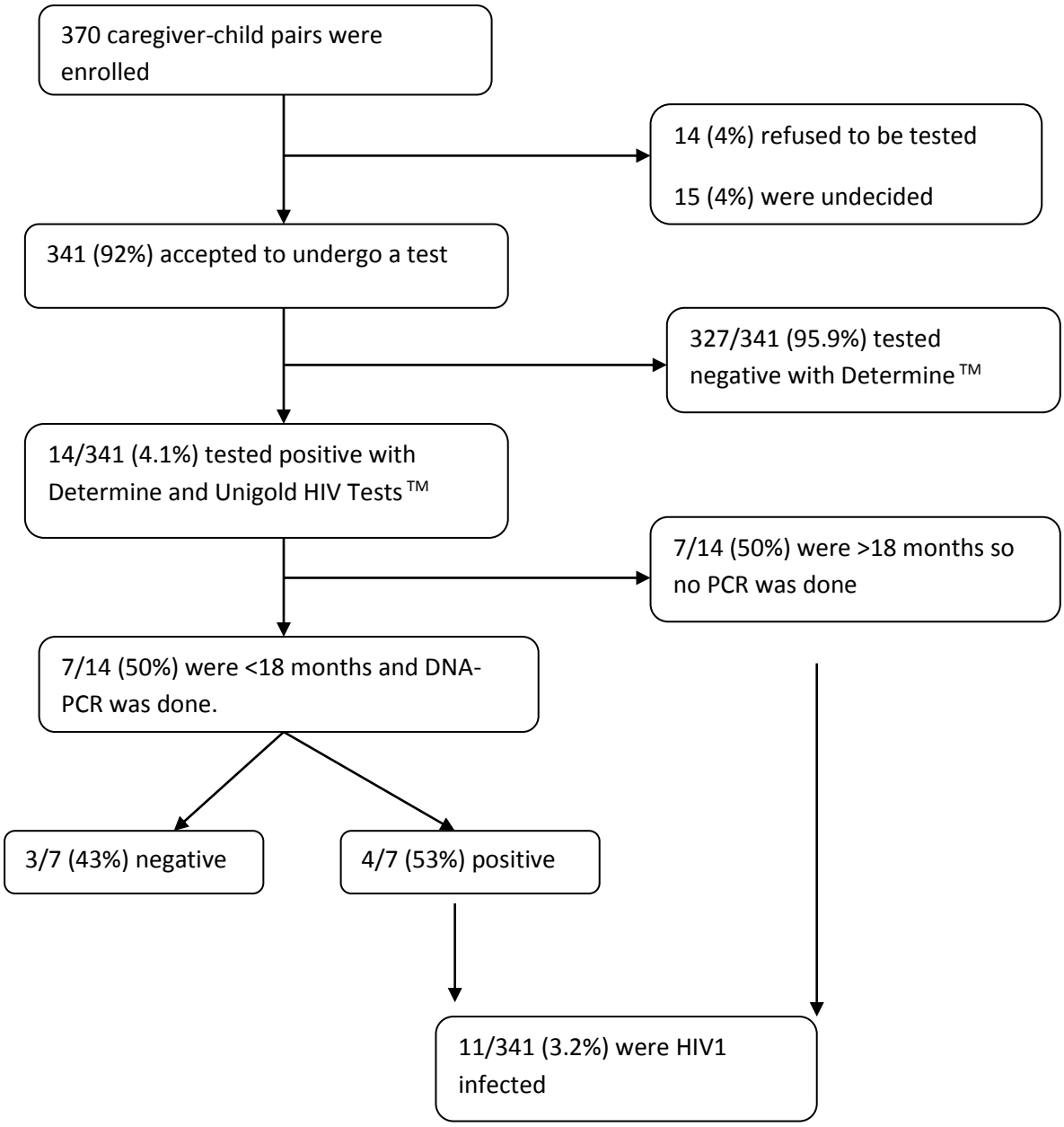
Bivariate and multivariate analysis

The association between dependent variable (accepted versus refused and acceptance versus undecided) with each of the care taker characteristics was explored using a chi

square test. Where violations of a chi square test were observed e.g. the expected numbers of observations per cell were less than 5 a fisher's exact test was used. Further, a bivariate logistic regression between the outcome and the caretaker characteristics were carried out to test for the magnitude of association using logistic regression.
A multivariable analysis to identify predictor factors associated with accepting a HIV test was undertaken as final step.

For the logistic regression analysis, an odds ratio and corresponding 95% confidence intervals and Wald test p values are reported

Figure 3: Flow of events.



RESULTS

Demographic characteristics

Between December 2013 and February 2014 a total of 370 participants (caregiver-child pair) were recruited into the study and an HIV test for the child offered. There were more Male children 193/370 (52.2%) than female. The age distribution was from 1 month to 169 months, with a median of 13 months and an Interquartile Range (IQR) of 8 to 22 months.

Table 1: Caregiver's characteristics (n=370)

Characteristics	Number (N)	Percentage (%
Marital status (370)		
Single[$]	301	81.3
Married	61	16.4
Divorced	5	1.4
Widowed	3	0.8
Age of mother/caretaker		
Mean (SD)	27 (7)	
15 – 19 years	45	12.2
20 – 29 years	219	59.2
30 and above	106	28.6
Area of residence		
Rural	44	11.9
Urban	326	88.1
Level of education of caretaker		
None	49	13.2
Primary	227	61.3
Secondary& Tertiary	94	25.4
Occupation of caretaker		
Unemployed	227	61.4
Student	46	12.4
Employed	97	26.2
Number of children under your care		
Median (IQR)	3 (2 – 4)	
1 – 3 children	246	66.4
4 or more children	124	33.5
Relationship between caregiver and child		
Biological mother	356	96.2
Others	14	3.8
Income level per month		
Less than 50 dollars(us)	323	87.3
51 – 100 dollars (US)	33	8.9
More than 100 dollars(us)	14	3.8

$ This group includes those not legally married, it however has a number of people who cohabit with their partners; *these group includes stepmother, grandmother, sister etc.
Angolan currency is Kwanza which is the equivalent to 0.1 US Dollar

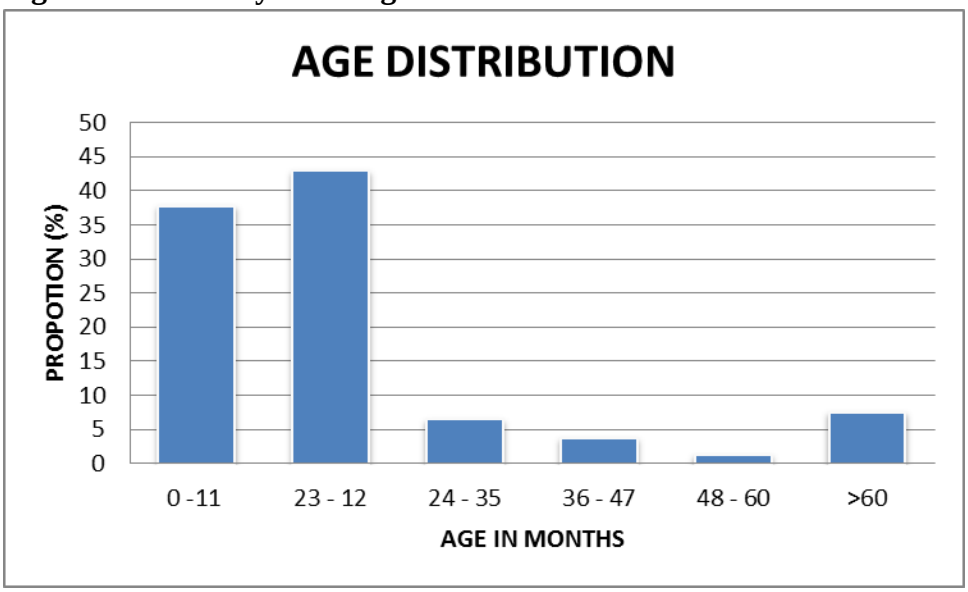
Majority 301/ 370 (81.3%) of the caregivers were single. This group denotes those who are not married in the legal/official sense but includes those who could be cohabiting with their partners. The mean age of caregivers was 27 years. Majority 326/370 (88.1%) of the participants resided in the urban areas close to the hospital. A significant number of respondents, 321/370 (86%) had some form of education with a majority having primary school education, Table 1.

Most 356/370 (96.2%) caregivers were the biological mothers of the children with only a small 14/370 (3.8%) proportion having other relations (sister, grandmother and stepmother…).

Table 2: Children's characteristics

Characteristics	Number (N)	Percentage (%)
Gender of the child		
Male	193	52.2
Female	177	47.8
Age of the child (months)		
0 – 11	140	37.84
12 - 23	159	42.9
24 – 35	24	6.49
36 – 47	14	3.78
48 – 60	5	1.35
>60	28	7.5
Median age (IQR) (months)	13	8 – 22

Figure 4: Summary of the age distribution of the children



The median (IQR) age for children was 13 (8 -22) years with majority of the children 299/370 (80.8%) being less than 24 months (2 years).

Table 3: Knowledge of caregivers on source of HIV infection (n=370)

Parameter	**Number (%)**
Sexual intercourse(heterosexual intercourse)	344 (93.0)
Unsterile equipment (needle, scissor, razor, knife…)	325 (87.8)
Injections	205 (55.4)
Breast milk	198 (53.5)
Blood transfusion	162 (43.8)
Homosexuality(man having sex with man)	46 (12.4)

A significant number of respondents 344 (93%) were aware that sexual intercourse can lead to transmission of HIV. Less than half (43.8%) had the knowledge that blood transfusion could lead to HIV transmission, and just slightly more than half 53.5% knew that breastfeeding is a probable way of transmitting HIV(Table 2).

HIV testing acceptability

A total of 370 caregiver-child pairs consented to participating in the study, of these, 341 (92%) accepted to undergo a HIV test, 14 declined the test while 15 were undecided on whether to consent for HIV testing or not.

HIV testing acceptability rate was 341/370 (92%; 95% CI 89 - 94) based on a conservative assumption which took into account all caregivers included in the study of whom 4% (95% CI 2 – 6) were not decided at the time of the interview (figure 5) . A less conservative HIV testing acceptability was 341/355(96.1%; 95% CI 93.5 – 97.8) when respondents who were undecided were excluded. The most common reason given for being unwilling or undecided to take the HIV test was fear of the father of the child (59%).

Figure 5: Acceptance of testing of the caregivers (n=370)

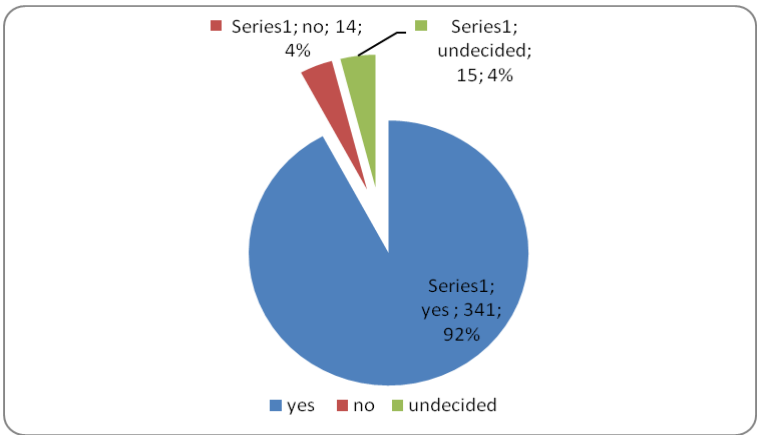
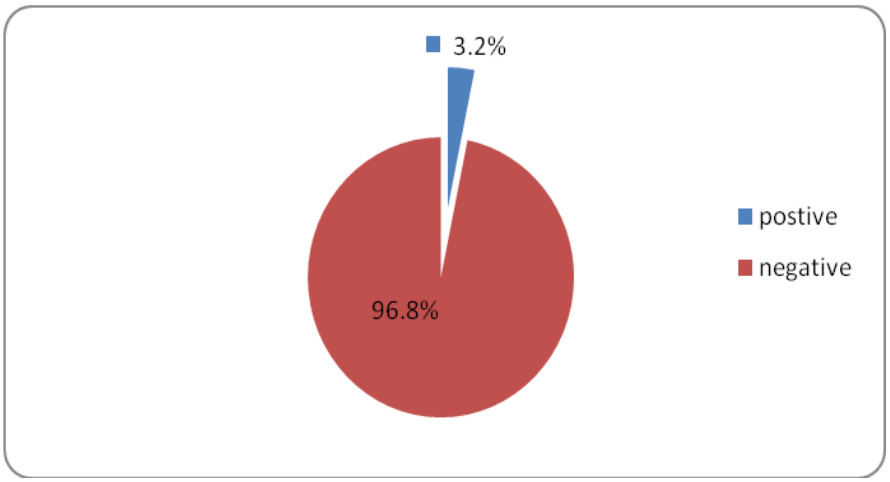
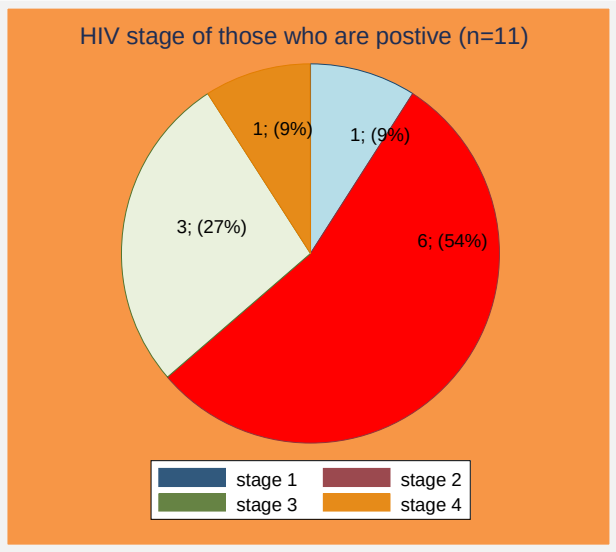


Figure 6: HIV status of those who accepted to undertake the test (n=341)



Fourteen (4.1%) children tested positive on Determine and unigold, 7 of them under the age of 18 months. For the children under the age of 18 months an additional check using a DNA PCR (Polymerase chain Reaction test) was done - and PCR results were positive in 4 of them while 3 children were negative. Giving a figure of 11 of 341 children testing HIV infected. The prevalence of HIV infection among these children was 3.2% (95% CI 1.6 to 5.7%).

Figure 7: HIV staging of those with a positive result



HIV staging		*Age in months*
Stage I	1	*6*
Stage II	6	*4,11,19, 20, 24, 26*
Stage III	3	*8, 19,23*
Stage IV	1	*29*

Of those who were positive, majority of children 6 (54%) had stage two HIV disease and one had stage four disease as shown in figure.

All HIV positive children had "advanced" disease (Stage 2 to 4), except one who was stage 1

Association of care giver and children characteristics and HIV testing

Table 4: Association of caregiver characteristics and acceptance to get a test

Characteristic	Acceptance to a test			
	Yes n = 341 (%)	Refused n =14 (%)	Odds ratio (95% CI)	p-value
Marital status				
Not Married$	282 (95.9)	12 (4.1)	1.00	
Married	59 (96.6)	2 (3.4)	1.21 (0.26 – 5.57)	0.80
Age of mother/caretaker				
15 – 27years	222 (97.3)	6 (2.7)	1.00	
28 and above	119 (93.7)	8 (6.3)	0.95 (0.24 – 2.11)	0.54
Area of residence				
Rural	38 (88.4)	5 (11.6)	1.00	
Urban	303 (97.1)	9 (2.9)	4.43 (1.41 – 13.91)	0.02
Level of education				
None	43 (87.8)	6 (12.2)	1.00	
Primary	209 (97.7)	5 (2.3)	5.8 (1.7 – 20.0)	0.005
Secondary/Tertiary	89(96.7)	3 (3.3)	4.14 (0.99 – 17.34)	0.052
Occupation of caretaker				
Unemployed#	250 (95.1)	13 (4.9)	1.00	
Employed	91 (98.9)	1 (1.1)	4.73 (0.61 – 36.69)	0.065
Number of children				
1 – 3 children	230 (96.6)	8 (3.4)	1.00	
4 or more	111 (94.9)	6 (5.1)	0.64 (0.22 – 1.90)	0.425
Relationship between caregiver and child				
Biological mother	328 (96.2)	13 (3.8)	1.00	
Non-mother*	13 (92.9)	1 (7.1)	0.52 (0.06 – 4.24)	0.57
Income per month (N=353)				
<50 dollars	296 (95.8)	13 (4.2)	1.00	
> 50 dollars	45 (97.8)	1 (2.2)	1.95 (0.25 – 15.45)	0.52
Gender of the child				
Male	181 (98.4)	3 (1.6)	1.00	
Female	160 (93.6)	11 (6.4)	0.24 (0.07 – 0.88)	0.02
Childs age				
0-13 months	185 (94.3)	11 (5.7)	1.00	
>13 months	156 (98.1)	3(1.9)	3.01 (0.85 – 11.28)	0.09
ANC testing and counseling				
Yes	236 (96.3)	9 (3.7)	1.00	
No	105 (95.4)	5 (4.6)	0.72 (0.24 – 2.22)	0.57
Peri-natal follow-up				
Yes	15 (100.0)	0 (0)		
No	326 (95.9)	14 (4.1)	----------	--------
Past admission				
Yes	105 (98.1)	2 (1.9)	1.00	
No	236 (95.2)	12 (4.8)	0.42 (0.09 – 1.96)	0.27

$ includes single, divorced and widowed; #includes students who have no source of income; *includes step-mother, grandmother

303 (97.1%) of Urban dwellers, accepted the HIV test compared to 38(88.4%) of the rural dwellers. Urban dwellers were significantly more likely to accept testing with OR **=4.4 (95% CI 1.41, 13.9) p=0.02.**

Education was significantly associated with accepting of HIV testing. A total of 298/306 (97.4%) participants with some education accepted the HIV test compared to 43/49(87.8%) who had no education.

Parents of female children were less likely to accept the HIV test compared to parents of male children. Overall 181\184 (98.4%) of male children were tested compared to 160\171 (93.6%) female children OR**=0.24(95% CI 0.07, 0.88) P=0.02.**

The age of caretaker, relationship to the child, occupation, Income levels and number of children were however not associated with the acceptance of HIV testing.

Table 5: Association of caregiver characteristics and indecisiveness to get a test

Characteristic	Acceptance to a test			
	Yes n = 341 (%)	Undecided n=15(%)	Odds ratio (95% CI)	p-value
Marital status *(N=356)				
Not Married	282 (94.9)	15(5.1)	1.00	<0.001
Married	59 (100.0)	0 (0.0)	18.8 (11.18 – 36.60)	
Age of mother/caretaker				
15 – 27years	222 (97.3)	6 (2.7)	1.00	
28 and above	119 (92.9)	9 (7.1)	0.64 (0.21 – 1.90)	0.419
Area of residence				
Rural	38 (97.4)	1 (6.7)	1.00	
Urban	303 (95.6)	14(4.4)	0.57 (0.07 – 4.45)	0.59
Level of education				
None	43 (100.0)	0 (00.0)	1.00	
Primary	209 (94.1)	13 (5.9)	----------	-----
Secondary/Tertiary	89(97.8)	2 (2.2)	----------	
Occupation of caretaker				
Unemployed[#]	250 (96.2)	10(3.8)	1.00	
Employed	91 (94.8)	5 (5.2)	0.73 (0.24 – 2.19)	0.57
Number of children				
1 – 3 children	230 (96.6)	8 (3.4)	1.00	
4 or more	111 (94.1)	7 (5.9)	1.33 (0.47 – 3.78)	0.26
Relationship between caregiver and child				
Biological mother	328 (95.6)	15(4.4)	1.00	
Non-mother*	13 (100.0)	0 (00.0)	----------	------
Income per month (N=353)				
<50 dollars	296 (95.5)	14 (4.5)	1.00	
> 50 dollars	45 (97.8)	1 (2.2)	2.13 (0.27 – 16.58)	0.94
Gender of the child				
Male	181 (95.3)	9 (4.7)	1.00	
Female	160 (96.4)	6 (3.6)	1.33 (0.46 – 3.38)	0.60
Childs age				
0-13 months	185 (92.9)	14 (7.1)	1.00	
>13 months	156 (99.3)	1(0.7)	2.12 (0.27 – 16.58)	0.47
ANC testing and counseling				
Yes	236 (94.7)	13 (5.3)	1.00	
No	105 (98.1)	2 (1.9)	2.62 (0.58 – 11.82)	0.19
Peri-natal follow-up				
Yes	15 (100.0)	0 (00.0)	1.00	
No	326 (95.6)	15(4.4)	----------	-----
Past admission				
Yes	105 (94.6)	6 (5.4)	1.00	
No	236 (96.3)	9 (3.7)	2.11 (0.67 – 6.71)	0.19

An exploratory analysis comparing the undecided caretakers with those who accepted the test revealed that marital status was significantly associate with acceptance of taking HIV test with15/15(100%) of undecided being not married and 59/59 (100%) of the married accepting the test (p value=0.001).

Table 6: Knowledge of HIV/AIDs among women accepting or refusing HIV testing

Factor	Acceptance of HIV testing		Did not accept	
	Yes [n = 341] (%)	No [n = 14] (%)	Chi square statistic	P value
Is HIV/AIDS preventable				
Yes	271 (97)	9 (3)	1.86	0.172
No	70 (93)	5 (7)		
Need permission from spouse				
Yes	194 (95)	10 (5)	1.16	0.281
No	147 (97)	4 (3)		
Anticipated partner reaction to testing without their consent				
Angry	139 (94)	9 (6)	1.08	0.781
Indifferent	74 (99)	1 (1)		
No idea	128 (97)	4 (3)		
Can a woman transmit HIV virus to her baby?				
Yes	301 (96)	11 (4)	1.18	0.276
No	40 (93)	3 (7)		
Avenues of HIV transmission				
In the womb (intrauterine)				
Yes	214 (96)	9 (4)	0.01	0.907
No	127 (96)	5 (4)		
During delivery				
Yes	137 (97)	4 (3)	0.76	0.384
No	204 (95)	10 (5)		
Through breastfeeding				
Yes	220 (95)	10 (5)	1.17	0.280
No	121 (98)	4 (2)		
Hindrance to HIV testing				
Fear				
Yes	224 (96)	9 (4)	0.01	0.913
No	117 (96)	5 (4)		
Cost of the test				
Yes	35 (97.2)	1 (2.8)	0.14	0.704
No	306 (96)	13 (4)		
Ignorance				
Yes	56 (93)	4 (7)	1.41	0.234
No	285 (97)	10 (3)		
Stigmatization				
Yes	88 (98)	2 (2)	0.94	0.331
No	253 (95)	12 (5)		
Lack of testing centers				
Yes	41 (100)	0 (0)	1.90	0.17
No	300 (96)	14 (4)		
Knowledge on HIV/AIDs transmission factors (n=17)‡ Mean score (SD)	9.2 (3.1)	8.9 (3.5)	1.02 (0.87 – 1.21)	0.772

The participants were subjected to a questionnaire to determine their knowledge of HIV prevention, PMTCT of HIV and potential barrier to testing.

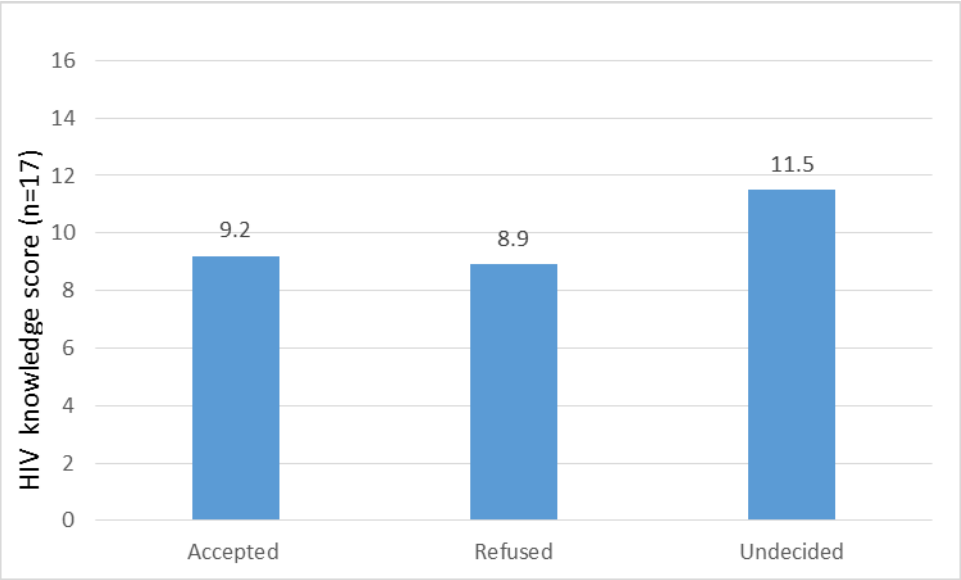
Overall 97% of the participants who knew that HIV was preventable accepted to take HIV test. There was no significant difference between caretakers who accepted testing HIV for the child and those who declined or were undecided.

A significant number of participants (95%) who indicated that they needed permission from their spouses to have the child tested had their children tested. Of those who did not need permission from the spouses to have the child tested, 97% had the child tested.

Table 7: Knowledge of HIV/AIDs among women accepting or Undecided on HIV testing

Factor	Acceptance of HIV testing		
	Yes [n = 341] (%)	**Undecided [n = 15] (%)**	**P value**
Is HIV/AIDS preventable			
Yes	271 (95.4)	13(4.6)	0.497
No	70 (97.2)	2 (2.8)	
Need permission from spouse			
Yes	194 (97)	5 (3)	0.072
No	147 (94)	10 (6)	
Anticipated partner reaction to testing without their consent			
Angry	139 (95.8)	5 (4.8)	0.684
Indifferent	73 (96)	3 (4)	
No idea	128 (94.8)	7 (5.2)	
Can a woman transmit HIV virus to her baby?			
Yes			
No	301 (96)	14 (4)	0.548
	40 (98)	1 (2)	
Avenues of HIV transmission			
In the womb (intrauterine)			
Yes	214 (94)	14 (6)	**0.015**
No	127 (99)	1 (1)	
During delivery			
Yes	137 (93)	10 (7)	**0.041**
No	204 (98)	5(2)	
Through breastfeeding			
Yes	220 (94)	13 (6)	0.077
No	121 (98)	2 (2)	
Hindrance to HIV testing			
Fear			
Yes	224 (95)	12 (5)	0.251
No	117 (98)	3 (3)	
Cost of the test			
Yes	35 (100)	0 (0)	0.191
No	306 (95)	15 (5)	
Ignorance			
Yes	56 (93)	4 (7)	0.299
No	285 (96)	11 (4)	
Stigmatization			
Yes	88 (95)	5 (5)	0.516
No	253 (96)	10 (4)	
Lack of testing centers			
Yes	41 (100)	0 (0)	0.153
No	300 (95.2)	15 (4.8)	
Knowledge on HIV/AIDs transmission factors (n=17)‡	9.2 (3.1)	11.5 (2.0)	0.003
Mean score (SD)			

Figure 8: Mean HIV knowledge score by HIV testing



There was no significant difference between knowledge of HIV prevention, PMTCT of HIV and potential barrier to testing factors between those who accepted and those who refused to have their child tested. However, knowledge of HIV transmission in the womb (p value=0.015) and during delivery (p value =0.041) were significantly associated with indecisiveness of having the child being tested for HIV.

Of those who knew that a woman can transmit HIV to her baby, 96% accepted their children to be tested as compared to 4% who were undecided.

Factors likely to hinder HIV testing included; fear, cost of the test, ignorance, stigmatization and lack of testing centers. None of these were significantly associated with either refusal to test or indecisiveness.

A composite score of the 17 knowledge questions in the questionnaire revealed that there was no difference in the knowledge of HIV among those who accepted testing compare to those who declined. However there was a significant association (p value =0.003) between those who accepted with those who were undecided with those who were undecided having a higher knowledge score (9.2 compared to 11.5 respectively) **See figure 8**.

Table 8: Adjusted[$] odds ratio of the factors predicting acceptance of a HIV test (n=355)

Characteristic	OR (95% CI)	P value
Education level		
None	1.00	
Some level of education	3.34 (1.02 – 10.96)	0.05
Residence		
Rural	1.00	
Urban	2.88 (0.86 – 9.58)	0.09
Occupation		
Unemployed	1.00	
Employed	1.25 (0.57 – 2.72)	0.57
Gender of the child		
Male	1.00	
Female	0.34 (0.09 – 1.30)	0.12

$ adjusted for the age of caretaker, and age of the child.

After successful iterations at the multivariable modeling, the significant predictors for HIV testing acceptability were education level and residence. There was evidence for an association of the education levels with willingness to be tested, caretakers with some level of education had 3 times higher odds of accepting the test compared to those with no education (OR 3.34; 95% CI 1.02 -10.96, p=0.05) after adjusting for all factors in the multivariable model.

Discussion

This facility based study was conducted to assess the acceptability of HIV testing of inpatient pediatric population (age 0 - 14 years) by their care givers. It also set out to explore the factors which are associated with acceptance or willingness to undergo an HIV test by the caregivers on behalf of the child. Consent was sought from the caregivers as the test subjects were minors.

The proportion of those who accepted the test was 92% with a confidence interval of 89% to 94%. This high rate is not unusual as the caregivers may probably be consenting to this due to the fact that once they have brought the child to the hospital they feel obliged to agree with all tests requested by the health worker. The small numbers of those who were undecided (15/370) and those unwilling (14/370) could be explained by the fact that these are probably people who are biological mothers of the child and they themselves are unaware of their status and as such they are not ready to discover their HIV status via proxy. There was also a small number who have to consult their male partners and that is quite common in the African setting[29]

This rate is quite comparable to the general consenting in children to be tested and although slightly higher than findings in Zambia by Kankasa[30] where acceptance rates were recorded as 87% and marginally lower than 95.1% reported in Kenya by Oyieko and colleagues in a study done in the tertiary referral hospital-KNH[39.] When compared to those in outpatient populations, this level is far much higher than the South African one where acceptance levels in the outpatient population was reported as 52% [31]. Others have reported about 81% in sub-Saharan Africa [32].

The prevalence of HIV among those who were tested was 3.2% (11/341) this is the first quantification of the prevalence among Angolan children. The lack of HIV prevalence for children is a common occurrence as most national surveys which estimate prevalence will generally exclude children under the age of 15. It is higher than the national adult prevalence of 2.8% [33]although this would be expected as those who are admitted are likely to be sicker than the general population and as such their prevalence would be higher.

The care givers who had some form of education either primary, secondary or post-secondary had higher odds of accepting their children to undergo HIV testing. This could be attributed to the fact that people who are generally more educated are more knowledgeable about the need to have an HIV test and its importance in the wellbeing

of their child. These findings are consistent with reports from other developing countries that have shown HIV testing rates to be higher in the educated more so in adults[34]. Further, knowing ones status has been shown to be a key de-motivator of consenting to a test[35].

There was evidence that those residing in urban areas had higher odds of consenting to the HIV test. This could be explained by them having a bit more knowledge about HIV and being recipients of mass media campaigns which more often are concentrated in urban areas. In addition, since people in urban settings are highly mobile and the catchment area mainly covers large populations, the stigma associated with testing in a facility near your place of residence is diluted because most health care providers will hardly know their clients at a personal level, neither will clients know one another, a situation which often limits testing in rural settings.

Marital status had no association with acceptance to the HIV test, although this was in contrast to anecdotal knowledge. This could be explained by the way in which the data was collected; the married category which is smaller compared to the single category was depicted as those who are officially married in the legal sense. This may have led to misclassification of many caregivers who live with their partners though not officially married as being single and this may have diluted the effect estimate.

However marital status was found to be strongly associate with indecisiveness with59\59 (100%) of the married accepting the test and 15\15 (100%) of the undecided being single.

In retrospect it is possible that had the data been collected to depict those who live alone (with the child) compared to those living with a partner then probably an association would have been detected in relation to acceptance and non acceptance.

A unique finding was the lack of a significant association of the relationship between the caregiver and the child; the non-mother care givers would have been expected to have higher odds of willingness to accept the HIV test compared to the biological mothers since this does not directly imply their status. These findings have been shown more often than not to be the case. For instance, in a Kenyan study, households were more likely to consent to a Childs test if they were not the biological parents [36]. However the lack of significant association could have been due to the small number of non-mothers compared to mothers and the study may not have been powered enough to detect this specific difference. Further, the socio-cultural setting in Angola may have influenced the behavior since it would not have been socially acceptable to consent for such sensitive tests if you are not the biological parent.

Knowledge about transmission of HIV was quite good with a big proportion of 93% knowing that sexual intercourse can lead to transmission. Of key note was the almost half the participants were not aware that transmission can occur during delivery. However, an interesting finding linked to PMTCT was that, of the women who accepted the test only 214\341 (62%) and 220\341 (64.5%)knew that HIV could be transmitted during pregnancy and breastfeeding and among those who did not accept the test 9\14(64.2%) and 10\14(71.4%) knew . These findings suggest inadequate dissemination of PMTCT information. This is a key area for intervention seeing that the majority of the care givers are young and as such are in their reproductive age and may be likely to bear children in the future. While male involvement, was not a significant factor in our study, reports from Malawi and Ghana show that this has positive effects on promoting acceptability of testing and improved psychosocial support in the event of positive results. Consistent with work done by Ackers and others [37], distance to a testing centre was associated with acceptability of HIV testing suggesting the need for innovative strategies to enable availability of HIV testing like mobile HIV testing. In contrast to previous studies [10, 11] that have shown stigma and fear as reasons hindering HIV testing, in this study we didn't find a significant association with the above factors suggesting improved education in the community and general acceptability of people living with AIDS.

LIMITATIONS AND STRENGTHS

Although this study collected patient level data on HIV infected children, these numbers were too few to allow any generalization. Further, this study was undertaken in a tertiary hospital hence extrapolation of results is limited to hospitals with similar status.

Despite these limitations, the large sample size and being the only such study in Angola make our findings useful and relevant in these settings.

Conclusion

- Acceptability of routinely offered HIV testing offered to children admitted to Lubango Provincial Paediatrics Hospital, Angola was high with 92% of study participations accepting the test for their children. The most common reason for declining or indecisiveness about taking the HIV test was fear of child's father.
- Factors significantly associated with acceptability of routinely offered HIV testing to children admitted to Lubango Provincial Paediatric Hospital were:
    i. Education level of caregiver was significantly associated with acceptability of HIV OR 3.34 (1.02 – 10.96)
    ii. Area of residence was significantly associated with acceptability with urban dwellers more likely to accept then rural dwellers OR 2.88 (0.86 – 9.58)
- Marital status was significantly associated with acceptability, with 100% of participants' undecided on whether to accept or decline the test being single.

Recommendations

- With acceptability of routinely offered HIV testing at 92%, the test should be offered to all children admitted to Lubango Provincial Pediatric Hospital.
- A study to determine factors associated with refusal or indecisiveness on giving consent to routinely offered HIV testing for children be conducted and come up with intervention.
- Sensitization on importance of accepting routinely offered HIV testing among the rural population be emphasized using mobile clinics.
- Involve both parents in pre-HIV counseling to minimize decline or indecisiveness on acceptability of HIV testing. This will provide an opportunity to address caregiver concerns and thus improve knowledge and promote acceptability of HIV testing.
- Efforts to make basic education available will go a long way in improving knowledge on HIV and thus improve acceptability of HIV testing in the community.

Work plan

TABLE 9: Timeline/Time frame

Activity	May 2013	Apr2013	May 2013	June 2013	July 2013	Aug 2013	Sep 2013	Oc2013
Proposal development	◆	◆	◆					
Proposal defense				◆				
Ethical clearance					◆	◆		
Logistics Pilot study						◆		
Data collection							◆	
Data entry and analysis							◆	
Report writing							◆	◆
Report submission							◆	◆

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APPENDIX 1: The WHO paediatric clinical staging system (Nov 2004)

WHO pediatric stage 1	Asymptomatic, persistent generalized lymphadenopathy (PGL),Hepatospleenomegally
WHO pediatric stage 2	Hepatosplenomegaly ,Popular pruritic eruptions, Seborrhoeic dermatitis Extensive human papilloma virus infection ,Extensive molluscum contagiosum, Fungal nail infections, Recurrent oral ulcerations, Linealgingivalerythema(LGE),Angularcheilitis,Parotidenlargement,Herpeszoster, Recurrent or chronic RTIs (otitis media, otorrhoea, sinusitis
WHO pediatric stage 3	**Conditionswhereapresumptivediagnosiscanbemadeontheba sisofclinicalsignsorsimpleinvestigations** Moderateunexplainedmalnutritionnotadequatelyrespondingtostandardtherapy Unexplained persistent diarrhea (14 days or more ,Unexplained persistent fever(intermittent or constant, prolonger more than one month),Oral candidiasis (outside neonatal period);Oral hairy leukoplakia, Acute necrotizing ulcerative gingivitis/periodontitis ,Pulmonary TB, Severe recurrent presumed bacterial pneumonia **Conditions where confirmatory diagnostic testing is necessary** Chronic HIV-associated lung disease including brochiectasis, Lymphoid interstitial pneumonitis (LIP),Unexplainedanemia(<8g/dl),andorneutropenia(<1000/mm^3)andorthrombocytopenia(<5000
WHO pediatric stage 4 Any age	**Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations** Unexplained severe wasting or severe malnutrition not adequately responding to standard therapy;Pneumocystispneumonia,Recurrentseverepresumedbacterialinfections(e.g. empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia),Chronic herpes simplex infection; (or labial or cutaneous of more than one month's duration); Extra pulmonary TB, Kaposi's sarcoma, esophageal candidiasis, CNS toxoplasmosis (outside the neonatal period), HIV encephalopathy **Conditions where confirmatory diagnostic testing is necessary**

	CMV infection (CMV retinitis or infection of organs other than liver, spleen or lymph nodes; onset at age one month or more); Extra-pulmonary cryptococcosis including meningitis. Any disseminated endemicmycosis (e.g. extra pulmonary histoplasmosis, coccidiomycosis, penicilliosis), Cryptosporidiosis, Isosporiasis, Disseminated non-tuberculosis mycobacterium infection, Candida of trachea, bronchi or lungs, Visceral herpes simplex infection, Acquired HIV associated rectal fistula, Cerebral or B cell non-Hodgkin lymphoma, Progressive multifocal leukoencephalopathy(PML),HIV-associated cardiomyopathy or HIV-associated nephropathy

The CDC Immunological staging system based on CD4+ cell counts by age (June 2004)

Immunological classification based on total and % CD4 count						
Immune category	Child's age					
	<12 months		1-5 years		6-12 years	
	CD4/UL	%	CD4/mL	%	CD4/mL	%
1. Not immune suppressed	>1500	>25	>1000	>25	>500	>25
1. Moderately immune suppressed	750-1499	15-24	500-999	15-24	200-499	15-24
1. Severely immune suppressed	<750	<15	<500	<15	<200	<15

APPENDIX 11: GUIDELINES for PRE and POST HIV TEST

COUNSELLING for CHILDREN

Pre HIV-test counseling

Clients

Childrenunder14andtheirparents/guardians are the clients

Childrenover14aretheclient

Introduction

Introduce yourself and clarify your role.

Discuss confidentiality and its limitations.

Assess the situation:

The best interest of the child must be considered.

What is the rationale for HIV testing?

Level of information on HIV and AIDS

Establish what the child or the parent/guardian knows about HIV and AIDS. Clarify any misconceptions and provide clear facts.

Identify the child's level of risk of HIV infection.

The HIV test

Explain the testing procedure and the type of test that will be administered.

Discuss how long it will take to receive the HIV test results as well as the procedure for giving the results to the client. Explore the consequences of the impact of testing ,the advantages and disadvantages of HIV testing

Assessthechild'sunderstandingofHIVandAIDS.Fillingapsandclarifymisconceptions.

Assess the level of risk. Address stigma and discrimination.

Discuss the ramifications of a positive or negative result: What would the family actually do? How would the lives of family members change?

School and work-related issues

Disclosure and support Quality of life

Cases of rape/sexual abuse

Rape has to be reported to police. Involve child in counseling as far as possible, depending on child's maturity and ability to understand information.

If child is at risk for HIV infection, initiate PEP as soon as possible, within 72 hours after rape.

Consent for HIV test, PEP and any other treatment to be obtained from parent/ guardian.

Post HIV-test counseling;

Childrenunder14and their parents /guardians are the clients,

Childrenover14aretheclient

Giving the HIV Result.

Assessing the situation, Assume that you were not the pre-test counsel and give comprehensive counseling.

Giving the test results; introduce yourself to the child or the parent /guardian of the child.

•Discuss confidentiality.

•Check if the client wishes to find out the results. If not, find out the reasons, but respect the decision.

•Give time for the client to absorb the information, wait for a response before proceeding

•Check their understanding of what the result means.

•If the result is negative, inform them about the window period.

Clarifyanymisconceptionsandanswerquestionsinasimpleanddirectmanner.Validate and normalize feelings. Respond to shock and distress with empathy. Identify the client's immediate concerns

Negative Result

Risk reduction;

•Discuss the development of the child's life skills and how theses kills can empower the child.

•Discusswillingnesstoattendongoingcounselingwheretheymaybeotherproblems, for example, sexual abuse, rape, and relationship/family problems.

•For older children, explore precautions and safer sexual practices.

•Stress the importance of remaining negative and discuss how to stay negative. Discuss how the child can protect him/ herself and others in future emphasizing that this is also relevant if in the window period.

Positive Result

If the parent/guardian chooses to disclose to the child

Reassess the parent/guardian's plan of action with regard to disclosure. Discuss how to create an enabling environment for disclosure. What exactly do they want to say? How will the status be disclosed? Where will they speak to the child?

•Discuss disclosing the child's HIV status to the child. Invite this disclosure to take place with the counselor and discuss how the parent/guardian would like this to happen.

•Inform the parent/guardian that the child has the right not to disclose his/her HIV status to other people until s/he is ready.

Talking to the child

•Use age-appropriate language and concepts that the child can understand.

•Ask the child what he/she is thinking and what they know about HIV and AIDS.

•Use words, pictures and drawings to explain about HIV.

•Ask the child if he/she has questions and answer them honestly and directly.

Living with HIV and AIDS; Assist clients in developing a plan to maximize support and minimize negative consequences. Help them identify their support systems and provide information about services. Encourage living positively. •Emphasize that the parent's attitudes and beliefs about the meaning/implications of being HIV positive influence the ways in which the child responds to being HIV positive.

•Discuss medical and treatment follow-up linked to stage of infection.

•Offer a follow-up session, education /information about HIV/AIDS and positive living.

Treatment; Explain the need for ongoing regular health checks and the interpretation of CD4 T-cell counts (measures the status of the immune system as regards to HIV) and of viral load test results (tests the amount of virus in your blood).

•Discuss long-term scenarios.

•Discuss the availability of ARV therapy, locations of the treatment, care and support in their province. Give contact details and call to book the first appointment for the child.

•If the client chooses to begin ARV treatment, education on treatment protocols and on the importance of compliance is essential. Discuss relations with family, household, neighborhood and school with a view to establishing a caring and supportive, social environment.

Risk reduction; explore the parent's and/or child's attitude towards the situation that may have initially caused the HIV infection.

- Explore the issue of possible abuse, and counsel on abuse.
- Assess the client's understanding of and commitment to risk reduction. Inform the client that re-infection can occur during unprotected sex, which makes it more difficult to treat opportunistic infections.

Follow-up; Medical follow-up: emphasize to the parent/guardian the importance of taking prompt action with regard to the treatment of symptoms.

Discuss how the parent/guardian can be involved in educating the child about safer sexual practices if the child is sexually active. This will be more effective if done within the context of disclosure.

APPENDIX III: Consent form

Study title:

Acceptability of routinely offered HIV testing among children admitted at Lubango Provincial Pediatric Hospital-Angola

PART A

Introduction

Dr Ketha Francisco of the Department of paediatrics, university of Nairobi is conducting a study concerning HIV testing among children and wants to offer you the opportunity to be part of it. Since you have been admitted in the ward, information on HIV has been given to you and we have held discussions concerning HIV. We discussed about HIV diagnosis and transmission, how it affects the health leading to opportunistic infections. There is a package of care available at Lubango paediatric hospital to keep HIV infected children through ARVS, co trimoxazole, balanced diet, updating immunizations, treatment of opportunistic infections and growth monitoring. The HIV infection in admitted children in the paediatrics wards are common and are not easy to tell whether a child is infected or not by general examination. The HIV testing is therefore being offered as part of the child's care in the wards. The aim of this study to find out your views concerning acceptability of HIV testing among children. Do you have questions so far?

Study procedures

Being in the study is your choice

This consent form gives you information about the study, the risks and benefits and the process that will be explained to you. Once you understand the study and if you agree to take part, you will be asked to sign or make your mark on this form and you will be given a copy. Before you learn about the study, it is important you know the following:

Your participation in this study is entirely voluntary.

You may decide to withdraw from the study at any time, without facing any consequences.

Purpose of the study

The purpose of the study is to establish acceptability of routinely offered HIV testing among children admitted at Lubango Paediatric Hospital-Angola

The study will involve:

If you are willing for you and your child to be part of the study, i will ask you some questions about you and your child and i will conduct a physical examination on your child. After the physical examination 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 finger tip of the left ring finger 3 times using 3 different spirit swabs. I will the puncture the finger tip off centre, like is done when taking blood to test for malaria parasites. The finger drop will be wiped away using a sterile gauze pad and will then draw a few drops of blood and test it and results are ready in 15 minutes. I will let you know the test result which if negative the child will continue with the management in the ward .If the test results will be positive, co trimoxazole will be started on the child if is at least 6 weeks old and your child will be registered, linked and followed at the CCC at the Lubango paediatric hospital. If your will be found to be in need of ART the child will be initiated on Pre ART preparations. If you would not like to know the HIV results, when/if blood is scheduled to be drawn for other tests during the child's stay in the ward; about 2 mls of blood will be kept aside in a bottle without a label. I will the test the blood anonymously, without knowing which particular child the blood belongs to. This means that neither you nor i will know the HIV status of your child.

Risks and/or discomforts

You will be requested to avail yourself for an interview at a place that you are most comfortable. You may become worried or anxious about discussing HIV matters. I will make every effort to protect your privacy and confidentiality while you are participating in the study. Further, HIV testing for your child might cause you some anxiety and the finger prick to draw blood may cause some pain to the child causing him/her to cry.

Benefits

During the child's physical examination any new information found will be relayed to the ward doctor so that he/she can give treatment. Knowing the child's HIV status will allow the child to get appropriate management. Even if your child does not directly benefit from this study you will know that your participation in the study will help to improve the quality of life of other children in the future.

Cost

The HIV test carried out in this study will be done at no cost to you and no money will be paid to you for participating in this study

Privacy and confidentiality

Every effort will be made to keep the information you provide confidential. You will be identified only by a code and personal information from the interview and the antibody test results will be handled with a high level of confidentiality. They will only be shared with the ward doctor for the benefit of the child in terms of treatment care and support. The results will not be released without your written permission. If you ever have questions about this study contact:

Principal Investigator, Francisco Ketha.
Cell phone no: +244923715091 Email: bhaibbyketha@yahoo.fr

PART B: CONSENT

Please read the information sheet (PART A) or have the information read to you carefully before completing and signing this consent form. If you have questions about the study, please ask the investigator prior to signing your consent form.

Declaration of the volunteer

I Mr./Miss/Mrs……..hereby give consent to …….. To include me in the proposed study entitled; Acceptability of routinely offered HIV testing among children admitted at Lubango Provincial Paediatric Hospital-Angola. I have read the information sheet concerning this study, I understand the aim of the study and what will be required of me if I take part in the study. The risks and benefits if any have been explained to me. Any questions I have concerning the study have been adequately answered. I understand that at any time that I may wish to withdraw from this study I can do so without giving any reason and without affecting the health care delivery. I realize that I will be interviewed once. I consent voluntarily to participate in this study.

Subject's name……Signature _____ Date_____

Name of investigator……Signature _____ Date_____

Appendix IV: HIV tests

ELISA

The enzyme-linked immunosorbent assay (ELISA), or enzyme immunoassay (EIA), was the first screening test commonly employed for HIV. It has a high sensitivity. In an ELISA test, a person's serum is diluted 400-fold and applied to a plate to which HIV antigens have been attached. If antibodies to HIV are present in the serum, they may bind to these HIV antigens. The plate is then washed to remove all other components of the serum. A specially prepared "secondary antibody" an antibody that binds to human antibodies is then applied to the plate, followed by another wash. Thus the plate will contain enzymes in proportion to the amount of secondary antibody bound to the plate. A substrate for the enzyme is applied and catalysis by the enzyme leads to a change in color or fluorescence. ELISA results are reported as a number; the most controversial aspect of this test is determining the "cut-off" point between a positive and negative result.

Western blot

The western blot is an antibody detection test, the viral proteins are separated first and immobilized and the binding of serum antibodies to specific HIV proteins is visualized. The cells that may be HIV-infected are opened and the proteins within are placed into a slab of gel, to which an electrical current is applied. Different proteins will move with different velocities in this field, depending on their size, while their electrical charge is leveled by a surfactant called sodium lauryl sulfate. Some commercially prepared Western blot test kits contain the HIV proteins already on a cellulose acetate strip. Once the proteins are separated, they are transferred to a membrane and the procedure continues similar to an ELISA. The person's diluted serum is applied to the membrane and antibodies in the serum may attach to some of the HIV proteins. The number of viral bands that must be present may vary. If no viral bands are detected, the result is negative. If at least one viral band for each of the GAG, POL, and ENV gene-product groups are present, the result is positive. The three-gene-product approach to western blot interpretation has not been adopted for public health or clinical practice. Tests in which less than the required number of viral bands is detected are reported as indeterminate and one need to be retested. Almost all HIV-infected persons with indeterminate western blot results will develop a positive

result when tested in one month; persistently indeterminate results over a period of six months suggest the results are not due to HIV infection. The HIV proteins used in western blotting can be produced by recombinant Deoxyribonucleic Acid (DNA) in a technique called recombinant immune blot assay (RIBA).

Rapid or point-of-care tests

The rapid antibody tests are qualitative immunoassays intended for use as a point-of-care test to aid in the diagnosis of HIV infection. These tests should be used in conjunction with the clinical status, history and risk factors of the person being tested. If no antibodies to HIV are detected, this does not mean the person has not been infected with HIV. It may take several months after HIV infection for the antibody response to reach detectable levels, during which time rapid testing for antibodies to HIV will not be indicative of true infection status. For most people, HIV antibodies reach a detectable level after two to six weeks. Although these tests have high specificity, false positives do occur. Any positive test result should be confirmed by a lab using the western blot.

Antigen tests

The p24 antigen test detects the presence of the p24 protein of HIV (also known as CA), the capsid protein of the virus. Monoclonal antibodies specific to the p24 protein are mixed with the person's blood. Any p24 protein in the person's blood will stick to the monoclonal antibody and an enzyme-linked antibody to the monoclonal antibodies to p24 causes a color change if p24 was present in the sample. Nucleic acid testing (NAT) is more effective for this purpose, and p24 antigen testing is no longer indicated if a NAT test is performed. The p24 antigen test is not useful for general diagnostics, as it has very low sensitivity and only works during a certain time period after infection before the body produces antibodies to the p24 protein.

Nucleic acid-based tests (NAT)

Nucleic-acid-based tests amplify and detect one or more of several target sequences located in specific HIV genes, such as HIV-I GAG, HIV-II GAG, HIV-env, or the HIV-pol. Since these tests are relatively expensive, the blood is screened by first pooling some 8-24 samples and testing these together; if the pool tests positive, each

sample is retested individually. Although this results in a dramatic decrease in cost, the dilution of the virus in the pooled samples decreases the effective sensitivity of the test, lengthening the window period by 4 days (assuming a 20-fold dilution, ~20hr virus doubling time, detection limit 50 copies/ml, making limit of detection 1,000 copies/ml). Since 2001, donated blood in the United States has been screened with nucleic-acid-based tests, shortening the window period between infection and detectability of disease to a median of 17 days (95% CI, 13-28 Days, assumes pooling of samples). A different version of this test is intended for use in conjunction with clinical presentation and other laboratory markers of disease progress for the management of HIV-1-infected patients. In the RT-PCR test, viral RNA is extracted from the patient's plasma and is treated with reverse transcriptase (RT) to convert the viral RNA into DNA. The PCR process is then applied, using two primers unique to the virus's genome. After PCR amplification is complete, the resulting DNA products are hybridized to specific oligonucleotides bound to the vessel wall, and are then made visible with a probe bound to an enzyme. The amount of virus in the sample can be quantified with sufficient accuracy to detect threefold changes.

In the Quantiplex DNA or branched DNA test, plasma is centrifugated to concentrate the virus, which is then opened to release its RNA. Special oligonucleotides that bind to viral RNA and to certain oligonucleotides bound to the wall of the vessel are added. In this way, viral RNA is fastened to the wall. Then new oligonucleotides that bind at several locations to this RNA are added, and other oligonucelotides that bind at several locations to those oligonucleotides. This is done to amplify the signal. Monitoring the effects of antiretroviral therapy by serial measurements of plasma HIV-1 RNA with this test has been validated for patients with viral loads greater than 25,000 copies per milliliter.

Description of dry blood spot

Dried Blood Spot testing (DBS) is a form of bio sampling where blood samples are blotted and dried on filter paper. Dried blood spot specimens will be collected by applying a few drops of blood, drawn by lancet from the finger, heel or toe, onto specially manufactured absorbent filter paper. The blood will be allowed to thoroughly saturate the paper and air dried for several hours. The specimens will be stored in low gas-permeability plastic bags with desiccant added to reduce humidity

and kept at ambient temperature, even in tropical climates. Once in the laboratory, technicians will separate a small disc of saturated paper from the sheet using an automated or manual hole punch, dropping the disc into a flat bottomed microtiter plate. The blood will be eluted out in phosphate buffered saline containing 0.05% Tween 80 and 0.005% sodium aside, overnight at 4°C. The resultant plate containing the eluates forms the "master" from which dilutions can be made for subsequent testing. As an alternative to punching out a paper disc, recent automation solutions extract the sample by flushing an eluent through the filter without punching it out.

DBS testing for HIV infection

The technology holds promise for expanding diagnostic services to HIV-infected infants in resource-poor settings due to the samples' longer lifespan with reduced need for refrigeration and the less invasive nature of the test compared with other methods. The dried blood spot testing can be used to detect genetic material of the actual virus, thereby avoiding the likelihood of a false positive result. The DBS specimens also pose less of a biohazard risk to handlers and are easier to transport or store than liquid blood specimen.

APPENDIX V: QUESTIONNAIRE& CHILD EXAMINATION FORM

A. Socio-Demographic characteristics of the caretaker:

1. Age (Years) ☐☐

2. Marital status: ☐
   1=Married 2=Single
   3=Divorced 4=Widowed

3. How are you related to the child? ☐☐
   1=Mother 2=Father
   3=Step mother 4=Sister
   5=Maternal grandmother 6=Maternal grandfather
   7=Other (specify)……

4. How long have you lived with the child?..... years

5. Number of children ☐☐

6. Residence (Code; 1=Rural, 2=Urban) ☐

7. Number of rooms in the residence ☐☐

8. Access to information (Code yes=1, no=2)
   i. Radio ☐ ii. TV ☐
   iii. Newspaper ☐ iv. Other ☐ Specify……

9. Religion ☐
   1=Christian 2=Muslim
   3=Traditional 4=Other (specify)……..

10. Highest education ☐
    1=None 2=Primary
    3=Secondary/Technical 4=Tertiary

11. Occupation ☐
    1=Unemployed 2=Student
    3=Self employed 4=Civil servant
    5=Other (Specify)…….

12. What is your income level per month(US$) ☐
    1=Below 50 2=60-100 3=`101-150 4=151-200 5=>200

B. Knowledge level of HIV/AIDS

13. Have you heard about HIV/AIDS?(Code yes=1, no=2) ☐

14. How does one get HIV/AIDS? (Code yes=1, no=2)
    i. Sexual intercourse (heterosexual) ☐
    ii. Blood transmission ☐
    iii. Unsterile instruments (barbering instruments, ☐

Blades, circumcision instruments
iv. Injections (unsterile needles)
v. Trans placental (in mothers womb)
vi. Breast milk
vii. Homosexual
viii. Other (Specify)……

15. Do you know of the various HIV tests? (Code yes=1, no=2)
16. If yes, which HIV test do you know?.....
17. Can a woman infected with the HIV virus transmit it to her baby? (Code yes=1, no=2)

18. If yes, how can HIV are transmitted? (Code 1=yes, 2=no)
    1. In the womb (intrautetine)
    2. During delivery
    3. through breastfeeding
    4. Other (Specify)……

19. Is HIV/AIDS preventable? (Code yes=1, no=2, don't know=3)

20. If yes, can HIV transmission be prevented from an Infected pregnant woman to the baby?
    1=Yes 2=No 3=Don't know

21. If yes, how can the HIV transmission be prevented From an infected woman to the baby? (Code yes=1, no=2)
    i. Giving special drugs to pregnant woman and the new baby
    ii. Avoid breastfeeding
    iii. Caeserian section delivery
    iv. No idea

22. What is the importance of awareness of child HIV testing? (Code yes=1, no=2)
    i. Know HIV positive children
    ii. Know HIV positive children and initiate them on ARVs
    iii. know children tested for HIV

23. What are the hindrances' towards HIV testing for children? (Code yes=1, no=2)
    i. Ignorance
    ii. Fear
    iii. Cost of the test
    iv. Lack of testing centres
    v. Stigmatization
    vi. Religious belief
    v. Religious belief
    vi Cu;tural issues
    vii. Parental pressure
    viii. Illiteracy

C. Permission of spouse

24. Do you need your spouse's permission before Your child is tested for HIV? (Code yes=1, no=2) ☐

25. Will the involvement of your spouse contribute To child's HIV testing? (Code yes=1, no=2, indifferent=3) ☐

26. How will your wife/husband feel if the child is HIV Tested without his/her knowledge/permission/consent? (Code angry=1, Indifferent=2, No idea=3 Other=4(specify)……. ☐

D. Child's family, socio and medical information

27. Age (Months) ☐☐

28. Sex (Code male=1, female=2) ☐

29. Family birth order…….

30. Is child schooling? (Code yes=1, no=2) ☐

31. If yes, Pre school years ☐ Primary years ☐

32. Religion ☐
(Code: Christian=1, Muslim=2, Traditional=3, Other=4(Specify)……..

33. Parent alive: (Code Father=1, Mother=2, Both=3) ☐

34. Immunization up to date per Angola national schedule (Code yes=1, no=2) ☐

35. If no, which immunization is missing: ☐
(Code: Oral polio=1, Pentavalent=2, Measles=3)

36. During the antenatal period was the mother counseled And tested for HIV? (Code yes=1, no=2) ☐

37. If yes, what were the HIV test results? (Code positive=1, negative=2) ☐

38. During the perinatal period was the mother and the child Followed up in the PMTCT program? (Code positive=1, negative=2) ☐

39. Has the child ever been admitted in the past? (Code yes=1, no=2) ☐

40. If yes, for how long (days) ☐☐

41. Number of previous admissions ☐☐

42. What are the reasons for the previous admission?.....

……

43. What are the reasons for the present admission?.....

……

E. Acceptance of HIV routine counseling & testing among children

44. What are the reasons for lack of prior HIV testing? (Code yes=1, no=2)
    i. Cost ☐
    ii. Lack of availability of HIV testing sservices ☐
    iii. No perceived risk of HIV infection ☐
    iv. Fear to know the HIV results ☐
    v. Other (specify)…… ☐

45. Will you be willing for the child to undergo HIV counseling and testing? (Code yes=1, no=2, undecided=3) ☐

46. If no or undecided what are the reasons? (Code yes=1, no=2)
    i. Need more time to think about it ☐
    ii. Afraid of wife/husabnd reaction ☐
    iii. Never believed to be infected ☐
    iv. Lack of privavcy/confidentiality ☐
    v. Other (specify)…… ☐

47. What are the reasons for accepting the HIV testing for your child? (Code yes=1, no=2)
    1. Dont trust my partner ☐
    2. To know the child's HIV status ☐
    3. Health worker asked for the child to be tested ☐

4. Protect child from complications
5. I believe the child is at risk
6. Frequent admissions of the child
7. Death of a sibling in the family
8. Other (specify)……

48. What is the single most important factor that will Encourage you to have HIV test for your child?
    1=If the child is sick and the doctor suspects HIV
    2=If the health care workers will treat my child well if HIV positive
    3=If there is enough privacy
    4=Other (Specify)……..

49. Whom will you reveal/share your child's HIV results with? (Code yes=1, no=2)
    1. Mother
    2. Father
    3. Friend
    4. Health care worker
    5. Religious leader
    6. Employer
    7. Sibling
    8. Partner
    Other ……fy……

50. HIV testing done? (Code yes=1, no=2)

51. HIV test: (Code positive=1, negative=2)
    i. Determine
    ii. Biolinine
    iii. Unigold
    iv. PCR

52. HIV status (Code positive=1, negative=2)

6. Child examination

6.1. General

6.1.1 Weight (gms)
6.1.2 Height (cm)
6.1.3 MUAC (cm)
6.1.4 Temperature◦C
6.1.5 Head circumference (cms)
6.1.6 Respiratory rate/min)
6.1.7 Heart rate/min

(Code yes=1, no=2)

6.1.8 Pallor
6.1.9 Jaundice
6.1.10 Central cyanosis
6.1.11 Peripheral cyanosis
6.1.13 Finger clubbing
6.1.13 Finger clubbing
6.1.14 Periorbital oedema
6.1.15 Pedal oedema
6.1.15 Pedal oedema
.16 Grunting
6.1.17 Palpable peripheral pulse
6.1.18 Lymphnodes >1cm in 1 anatomical site
6.1.19 Wasting

6.2 Head and neck (Code yes=1, no=2)

6.2.1 Facial dismorphism ☐ 6.2.2 Parotid enlargement ☐

6.2.3 Hair changes ☐ 6.2.3 Anterior fontanelle ☐
(Code open=1, closed=2)

		Code (yes=1, no=2)	Number of episode in 6 months
6.2.4	Otorhoea	☐	☐☐
6.2.5	Rhinorrhoea	☐	☐☐
6.2.6	Otitis media	☐	☐☐
6.2.7	Discharging eyes	☐	☐☐
6.2.8	Neck swelling	☐	☐☐
6.2.9	Increased JVP	☐	☐☐

6.3 Mouth Code (yes=1, no=2) Number of episode in 6 months

6.3.1	Oral ulceration	☐	☐☐
6.3.2	Oral thrush	☐	
6.3.3	Oral hairy leukoplakia	☐	
6.3.4	Gingivitis/periodentis	☐	
6.3.5	Oral curaneous lasting More than 1month	☐	
6.3.6	Inflammed throat	☐	

6.4 Skin Code (yes=1, no=2)

6.4.1	Popular pruritic eruption	☐
6.4.2	Seborrheic dermatitis	☐
6.4.3	Fungal nail infections	☐
6.4.4	Herpes zoster 1 episode in 12months	☐
6.4.5	Karposis sarcoma	☐
6.4.6	Any disseminatedendemic mycosis	☐
6.4.7	HPV or moll scum Infection >5% of body surface area/face	
6.4.8	Septic lesions	☐

6.5 Chest Code (yes=1, no=2)

6.5.1	Deformities (excavation scoliasiskyphasis)	☐	
6.5.2	Subcostal or intercostals recessions	☐	
6.5.3	Harissons sulcus	☐	
6.5.4	Visible/palpable costchondal junctions	☐	
6.5.5	Normal vesicular breath sounds	☐	if no Describe…..
6.5.6	Crepitations	☐	
6.5.7	Rhonci	☐	
6.5.8	Normal heart sound	☐	If yes Describe…….
6.5.9	Heart murmur	☐	es Describe…….

6.6 Abdomen Code (yes=1, no=2)

6.6.1 Umbilical hernia ☐ If yes Diameter…….

6.6.2 Palpable liver ☐ If yes cm below coastal margin……..

6.6.3 Other mass(es) ☐ If yes

Describe……..

6.7 Genitalia, groins and anus Code (yes=1, no=2)

6.7.1 Hernias ☐ If yes which……..…..

6.7.2 Descended testes ☐ If yes

which…… ☐

6.7.3 Recto-vesicular fistula If yes is it acquired? (Code yes=1, no=2 ☐

6.8 Musculo-skeletal Code (yes=1, no=2)

6.8.1 Deformities ☐ If yes Describe…….

6.8.2 Abnormal movements ☐

(tics,choreiform, athetoid) If yes which……..

6.8.3 Normal muscle tone ☐ If no Describe……..

6.8.4 Swollen joints ☐ es, which……

6.9 Milestones Code (yes=1, no=2)

6.9.1 Head control ☐

6.9.2 Sitting ☐

6.9.3 Standing ☐

6.9.4 Walking ☐

Level of consciousness (Alert) ☐

6.9.5 Eye movements directed ☐

6.4.6 Motor responses to pain (Code localizes=1, withdraws=2, absent=3) ☐

6.4.7 Verbal response (Code appropriate cry=1, inappropriate cry=2, none=3) ☐

6.10 Primitive reflexes if the child is a neonate Code (yes=1, no=2)

6.10.1 Rooting ☐ 6.10.2 Grasp ☐

6.10.3 Stepping ☐ 6.10.4 6.10.4 Moro ☐

Current diagnosis……

Stage of HIV based on the WHO criteria (Tick appropriate **1** **2** **3** **4**