



## RESEARCH ARTICLE

## Determinants of Caretakers Acceptability of HIV Testing among Children Admitted at Lubango Provincial Pediatric Hospital, Angola

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### Abstract

**Introduction:** Early diagnosis and treatment of HIV infected children is particularly important since they face a very high mortality rate. 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. Early diagnosis of HIV infected children is critical for optimal therapy and effective public health planning. Despite the critical importance of testing at-risk children for HIV, acceptance of pediatric testing among caregivers and children has not been well studied.

**Objective:** This study sought to determine factors associated with caregiver acceptability of HIV testing, associated factors and HIV prevalence among children admitted at Lubango Pediatric Hospital, Angola.

**Methods:** This was a cross sectional study where 370 caregivers/parents of the children admitted at Lubango Pediatric hospital in Angola were routinely offered HIV counseling and antibody testing for their children. For children less than 18 months tested HIV antibody positive (HIV+), a HIV DNA-PCR test was then conducted. Data was collected between December 2013 and February 2014.

**Result:** Of the 370 patients offered HIV testing, 341 (92%) accepted. Of the eligible children tested 11 (3.2%) were HIV infected. Urban dwellers were significantly more likely to accept testing compared to rural dwellers OR = 4.4 (95% CI 1.41, 13.9)  $p = 0.02$ . Majority  $n$  (86.7%) of the caregivers were educated and primary education was significantly associated with an increased chance of accepting for HIV test ( $p = 0.005$ ). The educated caretakers were 3 times more likely to accept HIV test compared to non-educated caretakers ( $p = 0.05$ ).

**Conclusion:** There is high acceptance of provider initiated HIV testing of pediatric inpatients. The predictors for HIV testing acceptability were higher education level and urban

domicile. Routine HIV testing should be incorporated in care package of children admitted in this hospital in Angola.

### Keywords

HIV, Testing, Acceptability, Children

### Introduction

The HIV epidemic in developing countries has a drastic effect on the lives of millions of children. 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. Identifying and diagnosing HIV-infected children poses a formidable barrier to engaging children in care. 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 diagnostic 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 center 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 and until recently, there has been limited guidance on pediatric HIV testing policies. 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 receive PMTCT prophylaxis. The infants are very unlikely to be identified and get on to treatment without targeted HIV testing strategies.

## Materials and Methods

### Study site

The study was conducted at 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 capacity of 150 beds. The hospital admits about 6783 children annually of whom approximately 169 are tested for HIV (Targeted test) and between 13%-18% turn positive.

### Study population

The study population consisted of all children admitted at Lubango Pediatrics Hospital and their caregivers. The inclusion of the study subjects was based on obtaining informed consent to participate in the study from parents/guardians of children aged 0-14 years with unknown HIV status.

### Study design

This was a cross-sectional study. The minimum sample size was 365 as determined using the Fishers formula and finite population correction factor. The recruited subjects had questionnaires administered to patient caretakers/parents until a sample size of 370 subjects was attained.

### Data collection

Between December 2013 and February 2014 a structured questionnaire was used to record data. It captured information on the socio-economic, socio-demographic characteristics and factors associated with routine HIV testing.

HIV testing was carried out in series, using 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. HIV antibody positive (HIV+) children less than 18 months of age were tested with PCR for HIV DNA.

### Statistical analysis

Data entry was done in duplicate for validation (double entry) and crosschecked for entry error and range checks. The data was cleaned and validated before analysis. The statistical package for the social sciences (SPSS) version 20 was employed for the data analysis. Results were presented in percentages, means and medians. Simple inferential statistics were employed.  $P < 0.05$  was taken as statistically significant.

### Ethical clearance

Ethical clearance was sought from the Kenyatta National Hospital /University of Nairobi Ethical Committee and Lubango Provincial hospital administration. Written consent was obtained from the caretakers willing to participate in the study.

## Results

### Socio-economic and demographic characteristics

A total of 370 participants (caregiver-child pair) were enrolled in the study and consisted of 193 (52.2%) male and 177 (47.8%) female children, with a median age of 13 months ranging from 1 month to 169 months as shown in [Table 1](#).

A high proportion of the caregivers n(82.3%) were single and the median age was 25 years. A majority of them n(88.1%) resided in the urban areas and n(86%) were educated and n(96.2%) were the biological mothers of the children as indicated in [Table 2](#).

### HIV testing acceptability and HIV test results

In this current study, n(92%) of the caregivers accepted their children to take the test for HIV. Approximately n(4%) caregivers were undecided and indicated fear of the father of the child as the main reason. Eleven (3.2%) of the children tested HIV positive, seven (2.5%) of these children were under the age of 18 months.

### Association of caregiver characteristics and acceptance to get a HIV test

Approximately n(97.1%) of urban dwellers, accepted to do the test compared to n(88.4%) of the rural dwellers. The urban dwellers were significantly likely to accept HIV testing with OR = 4.4 (95% CI 1.41, 13.9)  $p = 0.02$ . With regard to education level, those who had primary education had an increased likelihood of accepting HIV testing ( $p = 0.005$ ). There was a significant association between an acceptance to a HIV test and gender of the child as male children were more likely to be tested than female ( $p = 0.02$ ) as indicated in [Table 3](#).

**Table 1:** The demographic characteristics of children.

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	42.97
24-35	24	6.49
36-47	14	3.78
48-60	5	1.35
> 60	28	7.57
Median age (IQR) (months)	13	8-22

**Table 2:** Caregiver's socio-economic and demographic characteristics (n = 370).

Characteristics	Number (N)	Percentage (%)
Marital status (368)		
Single <sup>s</sup>	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

**Table 3:** Association of caregiver characteristics and acceptance to get a HIV test.

Characteristic	Acceptance to a test		Odds ratio (95% CI)	p-value
	Yes n = 341 (%)	Refused n =14 (%)		
Marital status <sup>§</sup> (N = 353)				
Single	282 (95.9)	12 (4.1)	1.00	0.80
Married	59 (96.6)	2 (3.4)	1.21 (0.26-5.57)	
Age of mother/caretaker				
15-27 years	222 (97.3)	6 (2.7)	1.00	0.54
28 and above	119 (93.7)	8 (6.3)	0.95 (0.24-2.11)	
Area of residence				
Rural	38 (88.4)	5 (11.6)	1.00	0.02
Urban	303 (97.1)	9 (2.9)	4.43 (1.41-13.91)	
Level of formal education				
None	43 (87.8)	6 (12.2)	1.00	0.005
Primary	209 (97.7)	5 (2.3)	5.8 (1.7-20.0)	
Secondary/Tertiary	89 (96.7)	3 (3.3)	4.14 (0.99-17.34)	
Occupation of caretaker				
Unemployed <sup>#</sup>	250 (95.1)	13 (4.9)	1.00	0.065
Employed	91 (98.9)	1 (1.1)	4.73 (0.61-36.69)	
Number of children				
1-3 children	230 (96.6)	8 (3.4)	1.00	0.425
4 or more	111 (94.9)	6 (5.1)	0.64 (0.22-1.90)	
Relationship between caregiver and child				
Biological mother	328 (96.2)	13 (3.8)	1.00	0.57
Non-mother <sup>*</sup>	13 (92.9)	1 (7.1)	0.52 (0.06-4.24)	
Income per month (N = 353)				
< 50 dollars	296 (95.8)	13 (4.2)	1.00	0.52
> 50 dollars	45 (97.8)	1 (2.2)	1.95 (0.25-15.45)	
Gender of the child				
Male	181 (98.4)	3 (1.6)	1.00	0.02
Female	160 (93.6)	11 (6.4)	0.24 (0.07-0.88)	
Childs age				
0-72 months	296 (95.8)	13 (4.2)	1.00	0.09
> 72 months	45 (97.8)	1 (2.2)	3.01 (0.85-11.28)	
ANC testing and counseling				
Yes	236 (96.3)	9 (3.7)	1.00	0.57
No	105 (95.4)	5 (4.6)	0.72 (0.24-2.22)	

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 students who have no source of income; \*: Includes stepmother, grandmother, sister etc.

**Table 4:** Adjusted<sup>§</sup> odds ratio of the factors predicting acceptance of a HIV test (n = 355).

Characteristic	OR (95% CI)	P value
Level of formal education		
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

<sup>§</sup>: Adjusted for the age of caretaker, and age of the child.

In multivariate modeling, independent predictors for HIV testing acceptability were education level and residence. The caretakers who had some level of education were 3 times more likely to accept HIV test compared to non-educated caretakers (OR = 3.34; 95% CI 1.02-10.96),  $p = 0.05$ ) after adjusting for all factors in the multivariable model as shown in [Table 4](#).

## Discussion

This facility-based study was conducted to assess the acceptability of HIV testing of inpatient pediatric population (age 0-14 years) by their caregivers. It also set out to explore the factors that 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 [6]. This rate is quite comparable to the general consenting in children to be tested and although slightly higher than findings in Zambia by Kankasa [7] 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 [8]. 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% [9]. Others have reported about 81% in sub-Saharan Africa [10].

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 years. The prevalence of HIV among these children is higher than the national adult prevalence of 2.8% [11] 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 caregivers 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 adult [12]. Further, knowing ones status has been shown to be a key de-motivator of consenting to a test [8].

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 as shown in a study conducted in rural area in Tanzania which demonstrated that uptake of HIV test was affected by fear about the social consequences of the illness and rejection by loved ones and discrimination [13].

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 non-married 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 associated with indecisiveness with 59/59 (100%) of the married accepting the test and among caretaker who were undecided, 15/15 (100%) were not married.

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 child's test if they were not the biological parents [14]. 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.

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 [15], distance to a testing center 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 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.

## Conclusion

In conclusion we observe that there is high acceptability of providers initiated testing of children in an in-patient setting. The predictors for HIV testing acceptability were higher education level and urban domicile.

## Limitations and Strengths

This study was undertaken in a tertiary hospital hence extrapolation of results should be 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.

## Recommendations

The government of Angola should consider adoption of routine provider initiated HIV testing to sick children receiving in-patient health services in tertiary hospital.

Further studies should be conducted to determine the prevalence among Angolan children and to assess the major obstacle about the non offer of HIV testing by health professionals in a tertiary pediatric hospital.

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